CCD-TR65/TR353
RMT-704

SERVICE MANUAL

US Model
Canadian Model
CCD-TR65
E Model
CCD-TR353

Video8
Handycam

A MECHANISM

- CCD-TR65/TR353 are based on model CCD-TR61/TR323.

[Main difference]
  - Color view finder is changed.
  - Some circuits of the VS-100 board have been changed.

- In this service manual, only the differences from CCD-TR61/TR323 are mentioned. When servicing, see the CCD-TR61/TR323 service manual (9-973-389-11) with this.

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

SPECIFICATIONS

Video Camera Recorder

System

Video recording system	Two rotary heads, Helical scanning FM system
Audio recording system	Two rotary heads, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette (standard 8 mm)
Tape speed	SP mode: Approx. 1.43 cm (19/32 inches)/s LP mode: Approx. 0.72 cm (5/16 inches)/s (playback only)
Recording time	SP mode: 2 h (P6-120)
Playback time	SP mode: 2 h (P6-120) LP mode: 4 h (P6-120)
Fastforward/rewind time	Approx. 6 min 30 s (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder: monochrome (CCD-TR61/TR323) color (CCD-TR65/TR353)
Lens	Combined 10 x Power zoom lens f = 6.2 to 62 mm (1/4 to 2 7/16 inches) F 1.6 to 2.9 (45 to 450 mm when converted to a 35 mm still camera) Attached 0.7 x Wide Angle lens f = 4.4 mm F 1.6 (32 mm when converted to a 35 mm still camera) TTL autofocus system inner focus wide macro system
Color temperature	Auto
Minimum illumination	1 lx (F 1.6)
Illumination range	1 lx to 100,000 lx
Recommended illumination	More than 100 lx

Input and output connectors

Video output	Phono jack, 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio output	Phono jacks –7.5 dBs (2:stereo L and R), (at load impedance 47 kΩ) impedance less than 2.2 kΩ
RFU DC OUT	Special minijack, DC 5 V
Remote jack	Stereo mini-minijack (ø 2.5 mm)
MIC jack	Stereo minijack, – 66 dBs low impedance with 2.5 to 3 V DC, output impedance 6.8 kΩ (ø 3.5 mm)

— Continued on next page —

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Average power consumption	6.0 W (CCD-TR61/TR323) 6.4 W (CCD-TR65/TR353) (camera recording) including the viewfinder
Installation	Vertically, Horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	CCD-TR61/TR323: Approx. 109 x 109 x 188 mm (w/h/d) (4 3/8 x 4 3/8 x 7 1/2 inches) CCD-TR65/TR353: Approx. 109 x 109 x 197 mm (w/h/d) (4 3/8 x 4 3/8 x 7 7/8 inches)
Mass	About 790 g (1 lb 11 oz) excluding the battery pack, lithium battery, cassette, and shoulder strap About 1,010 g (2 lb 4 oz) including the battery pack NP-55, lithium battery CR2025, cassette P6-120, and shoulder strap
Microphone	Electric condenser microphone, stereo type

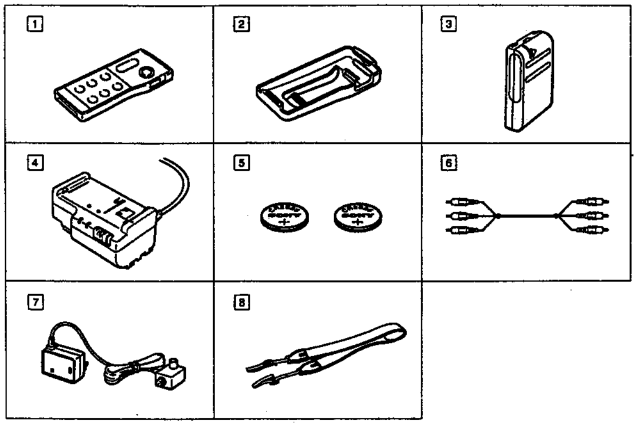
AC power adaptor

Power requirements	110 — 240 V AC*, 50/60 Hz
Power consumption	15 W (AC-V25) 17 W (AC-V25A)
Output voltage	DC OUT: 7.5 V, 1.2 A (AC-V25) 7.5 V, 1.5 A (AC-V25A) in operating mode Battery charge terminal: 10 V, 1.1 A in charge mode
Application	Sony battery packs NP-55/55H, NP-66/66H, NP-77/77H/77HD
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 103 x 49 x 63 mm (w/h/d) (4 1/8 x 1 15/16 x 2 1/2 inches) including projecting parts and controls
Weight	Approx. 290 g (10 oz) (AC-V25) Approx. 320 g (11 oz) (AC-V25A)

* Canadian Standard Association (CSA) certifies 120 V AC only.

Design and specifications are subject to change without notice.

Supplied accessories



1 **Wireless Remote Commander** (1)
2 **Remote Commander holder** (1)
3 **Battery pack NP-55** (1)
4 **AC power adaptor AC-V25/V25A** (1)
5 **Lithium Battery CR2025** (2)
(One is for the camcorder and the other is for the Remote Commander)
6 **A/V connecting cable** (1)
7 **RFU adaptor RFU-90UC** (1)
8 **Shoulder strap** (1)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit board Repairing
    - Keep the temperature of the soldering iron around 270°C during repairing.
    - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
    - Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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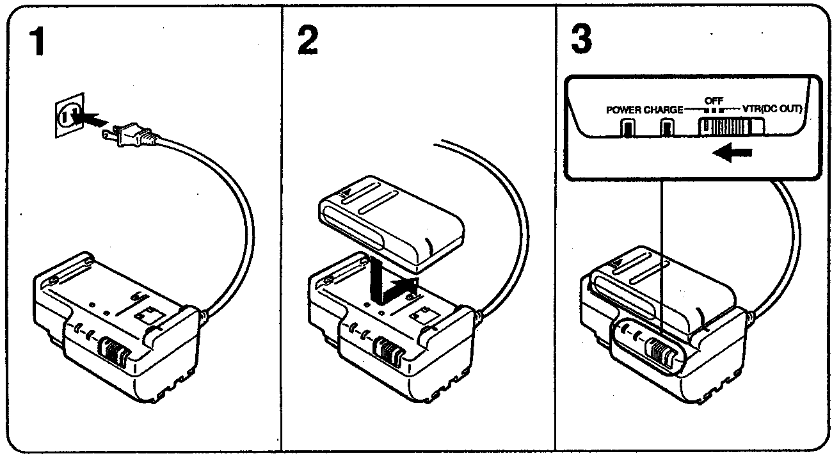
Getting Started

Charging and Installing the Battery Pack

Before using your camcorder, you first need to charge and install the battery pack. To charge the battery pack, use the supplied AC-V25/V25A AC power adaptor.

Charging the Battery Pack

Charge the battery pack on a flat place without vibration. (1) Connect the power cord to a wall outlet. (2) Align the right side of the battery pack with the white line on the AC power adaptor, then slide the battery pack in the direction of the arrow. (3) Set the selector to CHARGE. The POWER lamp (green) and the CHARGE lamp (orange) light up. Charging begins.
When charging is completed, the CHARGE lamp goes out. Set the selector to OFF and unplug the unit from the wall outlet. Then remove the battery pack and install it on the camcorder. To stop charging, set the selector to OFF.



Charging Time and Battery Life

When the battery life of a color viewfinder is different from that of a monochrome viewfinder, the battery life of a color viewfinder is indicated in the parenthesis.

Battery pack	NP-55 (supplied)	NP-77H NP-77HD	NP-77	NP-66H	NP-55H
Charging time*	70	160	140	120	80
Battery life**	50	135 (125)	105 (95)	100 (90)	60 (55)

- * Approximate charging time to charge an empty battery pack using the AC-V25/V25A (Lower temperatures require a longer charging time.)
- ** Approximate continuous recording time indoors

Important!

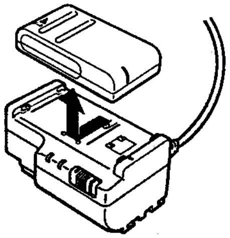
Use the battery completely before re-charging!

Before you recharge the battery, make sure the battery has been used up (discharged) completely. Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.

To use up the battery, remove the cassette and slide the POWER switch to CAMERA with the battery attached, and leave the camcorder until the ▭ indicator and the red lamp flash in the viewfinder.

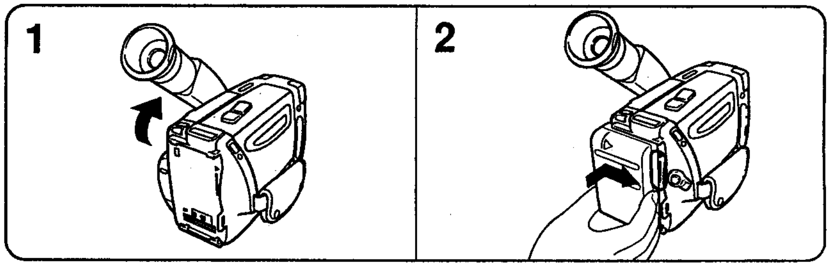
Removing the Battery Pack

Slide the battery pack in the direction of the arrow (see drawing).



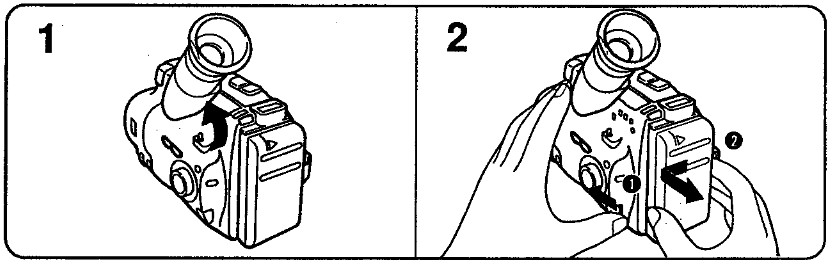
Installing the Battery Pack

(1) Lift up the viewfinder. (2) Align the right side of the battery pack with the white line on the camcorder, and slide the battery pack to the right.



Removing the Battery Pack

(1) Lift up the viewfinder. (2) While pressing BATT, slide the battery pack to the left.



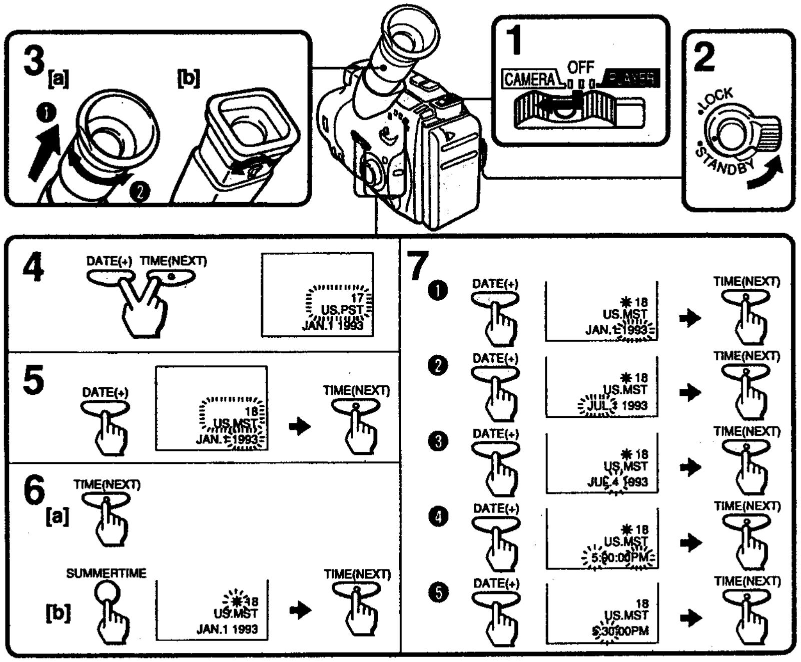
Note on charging the battery pack

- The POWER lamp will remain lit for a while even if the battery pack is removed and the power cord is unplugged after charging the battery pack. This is normal.
- If the POWER lamp does not light, set the selector to OFF and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to CHARGE again.
- You cannot operate the camcorder using the AC power adaptor while charging the battery pack.

This section is extracted from CCD-TR65 instruction manual.

Setting the Date and Time

You need to set the camcorder's date and time to record the correct ones onto your video. Before setting the clock, make sure a power source and lithium battery are installed. (1) While pressing the small green button on the POWER switch, slide it to CAMERA. (2) Turn the STANDBY switch to STANDBY. (3) Adjust the viewfinder lens: **[a]** When using a monochrome viewfinder, pull out the viewfinder until it clicks and turn the viewfinder lens adjustment ring so that the indicators in the viewfinder come into sharp focus. **[b]** When using a color viewfinder, move the viewfinder lens adjustment lever so that the indicators in the viewfinder come into sharp focus. (4) Press DATE (+) and TIME (NEXT) simultaneously until the area name and number appear in the viewfinder. (5) Press DATE (+) to set your home area. (See the table below.) (6) Set the Time: **[a]** For standard time, press TIME (NEXT). **[b]** For Daylight Saving Time, press DST and then press TIME (NEXT). (7) Adjust the flashing digits of the year, month, day and hour and minutes by pressing DATE (+) and TIME (NEXT). Note that when you keep DATE (+) pressed, the digits advance faster.



3 [a]
[b]
❶
❷
1
CAMERA
OFF
PLAYER
2
LOCK
STANDBY
4
DATE(+) TIME(NEXT)
17 US.PST JAN.1 1993
5
DATE(+)
18 US.MST JAN.1 1993
TIME(NEXT)
6 [a]
TIME(NEXT)
[b]
SUMMERTIME
18 US.MST JAN.1 1993
TIME(NEXT)
7
❶ DATE(+) 18 US.MST JAN.1 1993 TIME(NEXT)
❷ DATE(+) 18 US.MST JUL.1 1993 TIME(NEXT)
❸ DATE(+) 18 US.MST JUL.4 1993 TIME(NEXT)
❹ DATE(+) 18 US.MST 5:30:00PM TIME(NEXT)
❺ DATE(+) 18 US.MST 5:30:00PM TIME(NEXT)

Time Zone	Area Name	Area Number
Hawaii Standard Time	HAWAII	15
Alaska Standard Time	ANCHRGE	16
Pacific Standard Time Western Canada	US. PST	17
Mountain Standard Time	US. MST	18
Central Standard Time	US. CST	19
Eastern Standard Time Eastern Canada	US. EST	20

To Correct the Date and Time Settings

Press TIME (NEXT) repeatedly until the minute digits stop flashing. Then repeat steps 4 to 7.

To Check the Preset Date and Time

Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

To Reset to Standard Time

Press DST. The ✱ indicator goes off.

Note on the setting of the year

When you set the year, each time you press DATE (+) the digits change as follows.

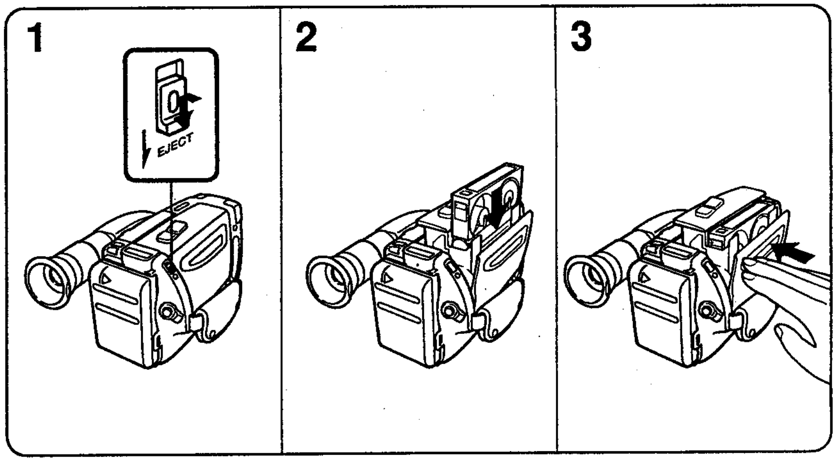
1993 → 1994 → ---- → 2020 (→ 1993)

Note on the time indicator

The internal clock of this camcorder operates on a 12-hour cycle.
12:00 AM stands for midnight.
12:00 PM stands for noon.

Inserting a Cassette

Make sure that the power source is installed. (1) While pressing the small blue button on the EJECT knob, slide it down. The cassette holder automatically lifts up and opens. (2) Insert a tape with the window facing out. (3) Close the cassette holder by pressing the "PUSH" mark on the cassette holder.

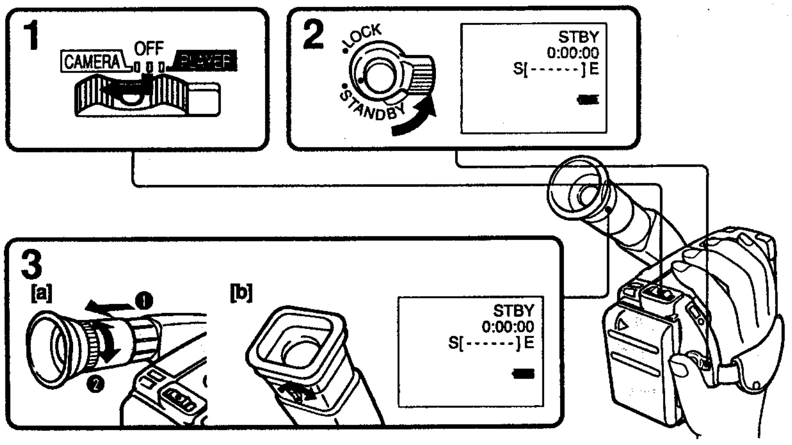


To Eject the Cassette

While pressing the small blue button on the EJECT knob, slide it down.

Adjusting the Viewfinder Lens

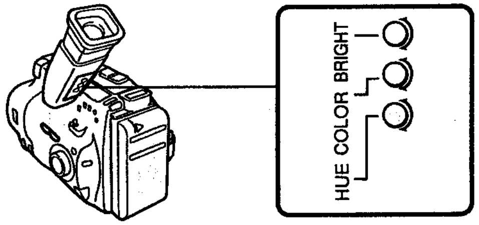
Before you use the camcorder for the first time or after someone else has used it, focus the viewfinder lens. Make sure that the power source is attached to the camcorder. (1) While pressing the small green button on the POWER switch, slide it to CAMERA. (2) Turn the STANDBY switch to STANDBY. (3) Focus on the indicators: **[a]** When using a monochrome viewfinder, pull out the viewfinder until it clicks, and turn the viewfinder lens adjustment ring so that the indicators in the viewfinder come into sharp focus. **[b]** When using a color viewfinder, move the viewfinder lens adjustment lever so that the indicators in the viewfinder come into sharp focus.



When Using a Color Viewfinder

To adjust the picture quality

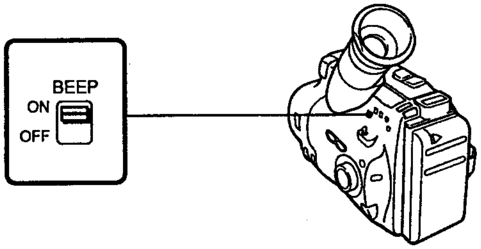
If you want to change hue, color and brightness of the picture displayed on the viewfinder screen, turn the screws on the viewfinder slowly using a screwdriver (not supplied). You do not need to adjust them in everyday operation.



	Turn clockwise	Turn counterclockwise
BRIGHT	More brightness	Less brightness
COLOR	More color intensity	Less color intensity
HUE	Greenish skin tones	Reddish skin tones

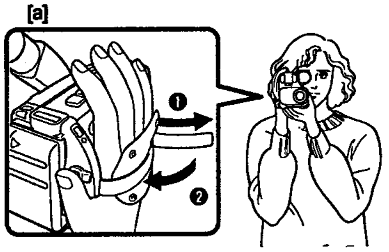
BEEP Feature

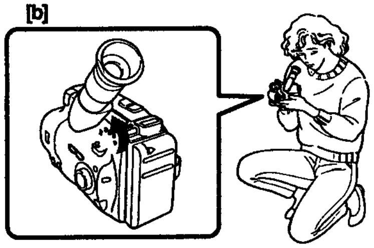
A beep sounds when you start recording and two beeps sound when you stop recording, confirming the operation.
Several beeps also sound as a warning of any unusual condition of the camcorder. Note that the beep sound is not recorded on the tape. If you do not want to hear the beep sound, set BEEP to OFF.



Hints for Better Shooting

For hand-held shots, you'll get better results by holding the camcorder according to the following suggestions:





- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb. **[a]**
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Turn the viewfinder up for recording from a low position. **[b]**

Place the camcorder on a flat surface or use a tripod

Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder (p. 41). Make sure the tripod screw is shorter than 6.5 mm (9/32 in).

Using the PROGRAM AE Function

You can select from four PROGRAM AE (Auto Exposure) modes to suit your shooting situation. When you use PROGRAM AE, you can get a Portrait effect (the subject is in focus and the background is out of focus) or capture high-speed action or record night views.

Selecting the Best Mode

Select one of four modes, referring to the following.

Portrait mode
- A still subject such as a person or a flower
- Zooming in on a subject in the telephoto mode
- A subject behind an obstacle such as a net

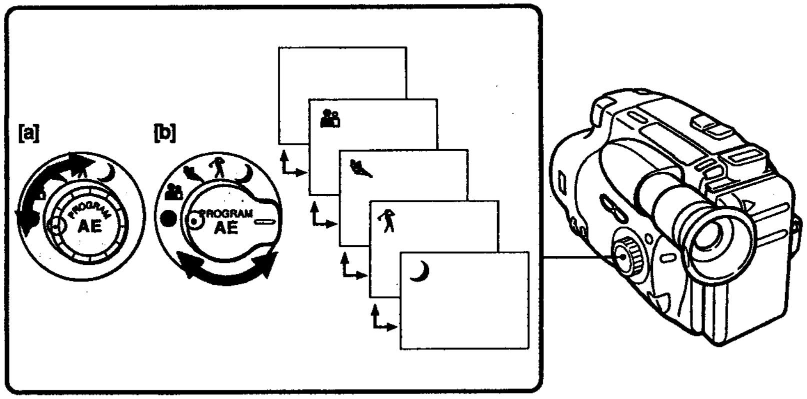
Sports mode
- Outdoor sports scene such as football, tennis, golf or skiing
- A landscape in a moving car

High speed shutter mode
- A golf swing or a tennis match in fine weather with the ball captured clearly
- Playing back certain scenes with high-speed movements in a clear, sharp picture

Twilight mode
- Recording night views, neon signs or fireworks

Using the PROGRAM AE Function

Set the white mark of the PROGRAM AE dial to the desired PROGRAM AE mode (**[a]** When using a monochrome viewfinder **[b]** When using a color viewfinder). The indicator of the selected PROGRAM AE mode appears in the viewfinder.



Note on shutter speed
The shutter speed in each PROGRAM AE mode is as follows:
Portrait mode — between 1/60 to 1/2000
Sports mode — between 1/60 to 1/500
High-speed shutter mode — 1/4000
Twilight mode — 1/60

Additional Information

Playback Modes

The playback mode (SP or LP) is selected automatically according to the format in which the tape has been recorded. The quality of the recorded picture in LP mode, however, will not be as good as that in SP mode.

Note on AFM Hi-Fi stereo
When you playback a tape, the sound is in monaural if:
- You record the tape using this camcorder, then play it back on an AFM Hi-Fi monaural video recorder/player.
- You record the tape on an AFM Hi-Fi monaural video recorder, then play it back on this camcorder.

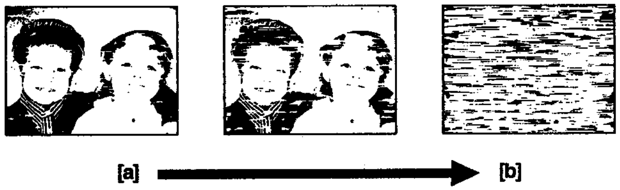
LP (long play) mode
When you playback a tape recorded in LP mode, the LP indicator lights up in the viewfinder.
This camcorder cannot record a tape in LP mode.

Foreign 8 mm video
You cannot playback the software recorded on a different TV color system. Because the TV color systems differ from country to country, you may not be able to playback foreign pre-recorded software. Refer to page 39 to check the TV color system of foreign countries.

Maintenance Information and Precautions

Video Head Cleaning

To ensure clear pictures, clean the video heads periodically. When playback pictures are "noisy" or hardly visible, the video heads may be contaminated.



[a] Slight contamination
[b] Critical contamination
If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than 5 times.)

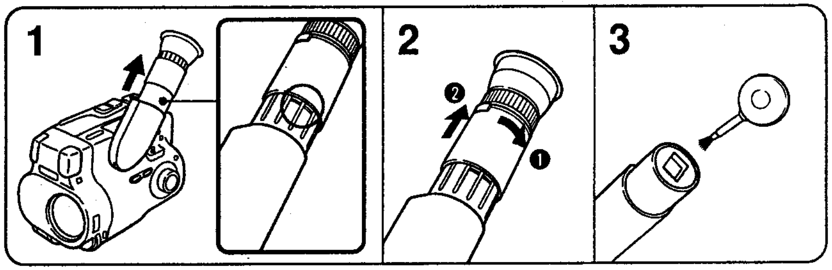
Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

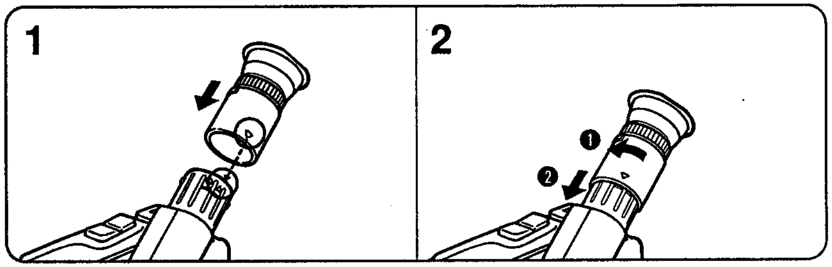
Maintenance Information and Precautions

Removing Dust from Inside the Viewfinder

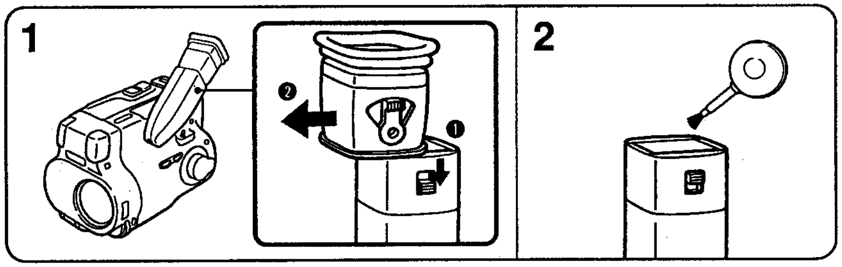
When Using a Monochrome Viewfinder
(1) Pull out the viewfinder barrel until the illustrated mark appears. (2) Turn the viewfinder counterclockwise until it stops, and pull it out. (3) Clean the surface with a commercially available blower.



To reattach the viewfinder barrel
(1) Align the mark on the viewfinder barrel with the mark on the viewfinder and push in the viewfinder barrel until it clicks. (2) Turn it clockwise until it stops and push it in.

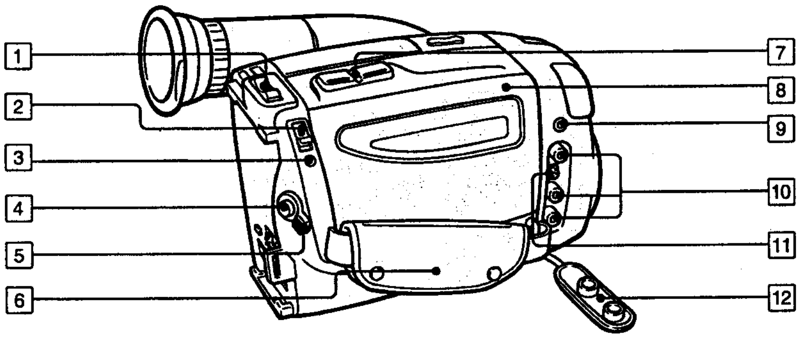


When Using a Color Viewfinder
(1) While pressing down the hook, slide the viewfinder barrel in the direction of the arrow and remove it from the viewfinder. (2) Clean the surface with a commercially available blower.



To reattach the viewfinder barrel
Slide the viewfinder barrel in the opposite direction of the arrow in the above illustration.

Identifying the Parts



1 **POWER switch** (p. 16, 23)
CAMERA: for camera recording
PLAYER: for playing back or editing a tape
OFF: power off

2 **EJECT knob** (p. 13)
Slide it to insert a cassette into the cassette holder or to eject the cassette.

3 **REMOTE Ⓛ (LANC) control jack**
Connect the LANC Ⓛ connecting cable to a wired remote control unit such as an editing controller. In this case, set the REMOTE COMMANDER switch to OFF.
Ⓛ stands for Local Application Control Bus System. The Ⓛ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.

4 **START/STOP button** (p. 16)
To start recording, press it after setting the POWER switch to CAMERA and turn the STANDBY switch to STANDBY. To stop recording momentarily, press it again.

5 **STANDBY switch** (p. 16)
STANDBY: To set the camcorder to recording standby mode.
LOCK: To stop recording or to prevent from accidentally recording and wearing down the battery.

6 **Grip strap** (p. 15)
Put your hand through the grip strap to hold the camcorder. Adjust the length of the strap so that your thumb can easily touch START/STOP.

7 **Power zoom button** (p. 18)
Press it to change the size of the subject in the scene.
T side: for telephoto (subject appears closer)
W side: for wide-angle (subject appears further away)

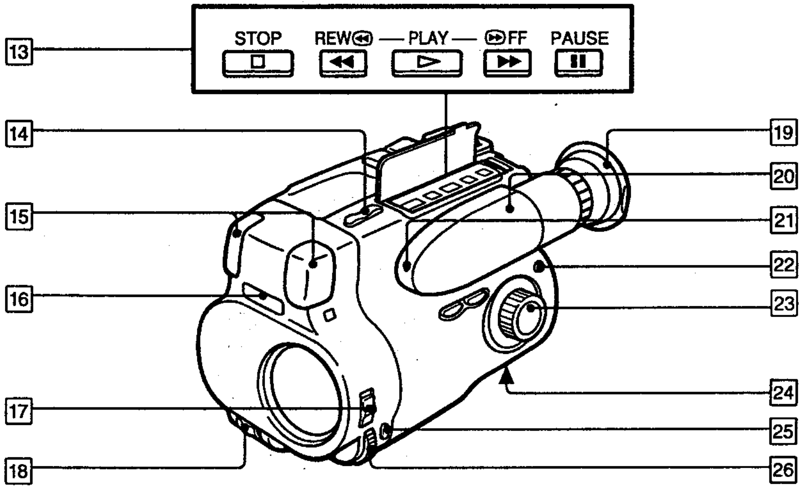
8 **Cassette holder** (p. 13)
When you slide the EJECT knob, this holder lifts up and opens automatically.

9 **MIC jack (PLUG IN POWER)**
Connect an optional external microphone (stereo or monaural). This jack also accepts a "plug-in-power" microphone.

10 **Audio/Video output jacks** (p. 22)
To view the recorded picture on the TV or to rerecord onto another tape, connect these jacks and the Audio/Video input jacks on the TV or VCR using the supplied A/V connecting cable.

11 **RFU DC OUT (RFU adaptor DC output) jack** (p. 22)
To view the recorded picture on a TV that has only an antenna input, connect the RFU adaptor here.

12 **Jack cover**



13 **Tape transport buttons** (p. 23)
☐ STOP
◀◀ REW (rewind)
▷ PLAY (playback)
▶▶ FF (fastforward)
❙❙ PAUSE

14 **EDITSEARCH button** (p. 21)
Press it to check the recorded scene in the viewfinder in Standby mode.
+ side: to view the forward playback picture
– side: to view the reverse playback picture

15 **Built-in microphone (stereo)**

16 **Remote sensor** (p. 44)
Aim the Remote Commander here for remote control.

17 **LENS COVER switch**
Before recording, slide it to OPEN. When you finish recording, slide it to CLOSE to protect the lens.

18 **WIDE ANGLE switch**
Slide it in the direction of the arrow to get the wide-angle picture.

19 **Eyecup**
To achieve better camera recording, place your eye firmly against it. If you wear glasses, bend it back to get a better view of the viewfinder. (You cannot bend back the eyecup of a color viewfinder.)

20 **Viewfinder** (p. 14, 21)
You can monitor the picture being recorded or played back. For details on the indicators in the viewfinder, see page 50.

21 **Camera recording/battery lamp**
This red lamp lights up during camera recording. When it flashes, the battery is dead.

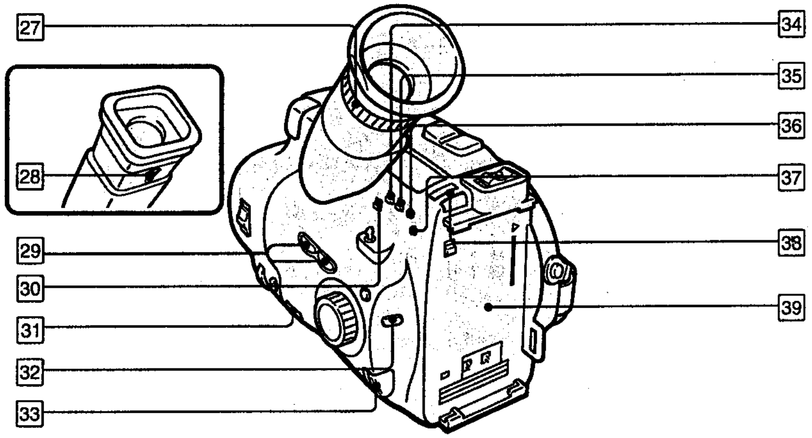
22 **FADER button**
When fading-in, press this switch during Standby mode and then press START/STOP. When fading out, press this switch during recording and then press START/STOP.

23 **PROGRAM AE dial** (p. 29)
Set it to select from four PROGRAM AE modes (Portrait/Sports/High-Speed Shutter-/Twilight mode) to fit the shooting situation.

24 **Tripod receptacle** (p. 15)
Attach a tripod (not supplied) here.
When attaching a non-SONY tripod, make sure that the length of the camera mounting screw is shorter than 6.5 mm (9/32 inches). Otherwise, the screw might damage the internal components of the camcorder.

25 **FOCUS button** (p. 27)
Press it to set the camcorder in manual focus.

26 **Focus dial** (p. 27)
Turn it to adjust the focus manually and to achieve a sharp focus in manual focus.



[27] **Viewfinder lens adjustment ring** (p. 14)
To focus the viewfinder lens, turn this ring until the indicator in the viewfinder comes into sharp focus.

[28] **Viewfinder lens adjustment lever** (p. 14)
To focus the viewfinder lens, move this lever until the indicator in the viewfinder comes into sharp focus.

[29] **DATE (+) and TIME (NEXT) buttons** (p. 12)
Press them to set the clock or to display or turn off the date and time in the viewfinder. When setting the date and time, press DATE (+) button to advance numbers and press TIME (NEXT) button to set the next factor.

[30] **BEEP switch** (p. 15)
To hear the beep sound, set this switch to ON.

[31] **Lithium battery compartment (bottom of the Camcorder)** (p. 10)
Insert a lithium battery here to activate the clock.

[32] **COUNTER RESET button** (p. 17)
Press it to reset the tape counter to zero.

[33] **BATT (battery eject) knob** (p. 7)
While pressing this knob, eject the battery pack.

[34] **REMOTE COMMANDER switch** (p. 43)
To use the Remote Commander, set this switch to ON.

[35] **EDIT switch** (p. 33)
To edit the recorded picture onto another tape on VCR, set this switch in the direction of the arrow.

[36] **DST (Daylight Saving Time) button** (p. 12, 31)
Press it to change the time to daylight saving time. To reset to standard time, press it again.

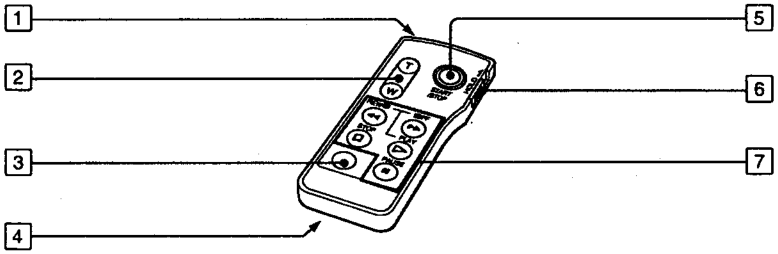
[37] **AREA button**
Press it to reset the clock according to the required time zone.

[38] **Hooks for shoulder strap** (p. 44)

[39] **Battery mounting surface** (p. 7)

Remote Commander

The buttons that have the same name on the Remote Commander and on the camcorder function identically.



[1] **Transmitter**
Point toward the remote sensor to control the camcorder after turning on the POWER switch on the camcorder.

[2] **Power zoom button**
The zooming speed is unchangeable in the Remote Commander.

[3] **DATA SCREEN/DISPLAY**
Press to display the viewfinder screen indicators on the TV when you connect the camcorder to a TV. To erase the indicators, press again.

[4] **Lithium battery holder** (p. 11)

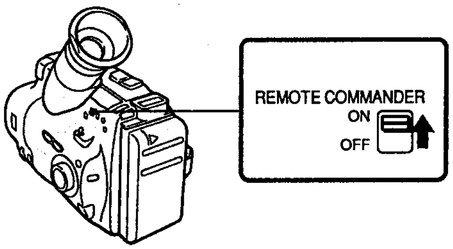
[5] **START/STOP button**

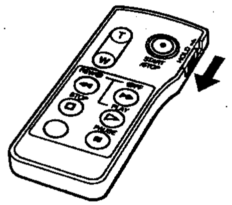
[6] **HOLD Switch**
Slide it in the direction of the arrow to prevent any misoperation. Before using this Remote Commander, slide it in the opposite direction of the arrow.

[7] **Tape transport buttons**

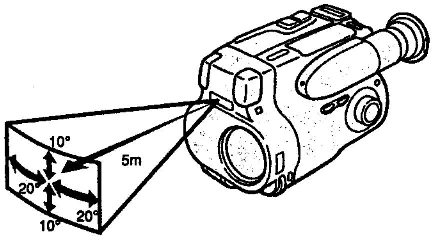
Using the Remote Commander

Make sure that the REMOTE COMMANDER switch on the camcorder is set to ON and that the HOLD switch on the Remote Commander is not working.





Remote Control Direction

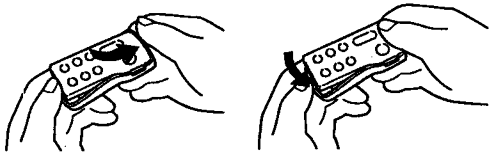


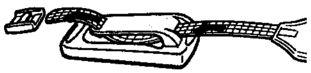
Note on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- This camcorder works at commander mode VTR 2. The commander modes (1, 2 and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

Using the Remote Commander Holder

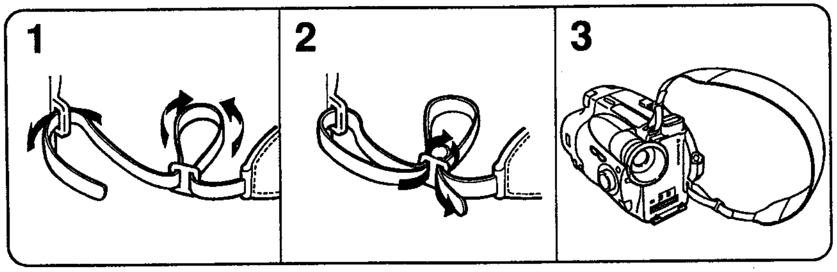
You can clip the Remote Commander holder on your coat pocket or belt, or slide it onto the shoulder strap before attaching the Remote Commander to it.





Attaching the Shoulder Strap

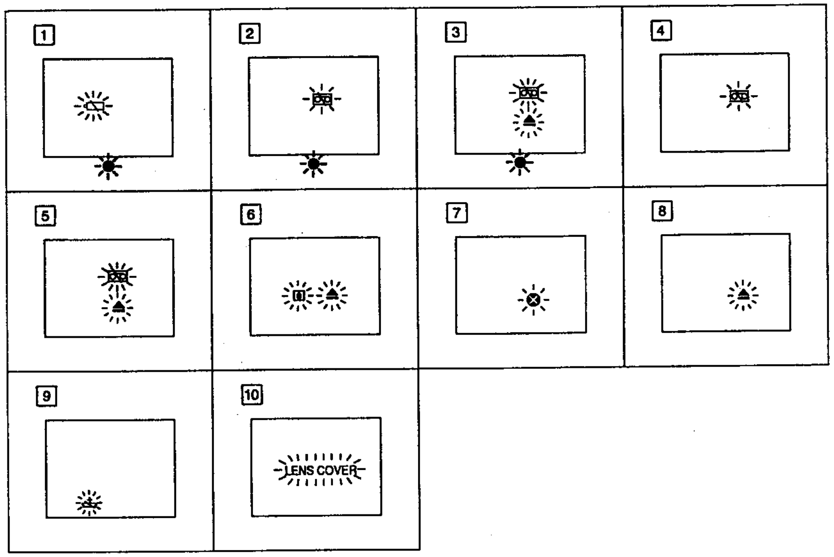
Attach the supplied shoulder strap to the hooks for the shoulder strap (p. 42).



Indicators in the Viewfinder

Warning Indicators

If indicators flash in the viewfinder or a caution lamp on the camcorder flashes, check the following:



1 The battery is weak or dead.
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.

2 The tape is near the end.
The flashing is slow.

3 The tape has run out.
The flashing becomes rapid.

4 No tape has been inserted.

5 The tab on the tape is out (red).

6 Moisture condensation has occurred. (p. 36)

7 The video heads may be contaminated. (p. 34)

8 Some other trouble has occurred.
Disconnect the power source and contact your Sony dealer or local authorized facility.

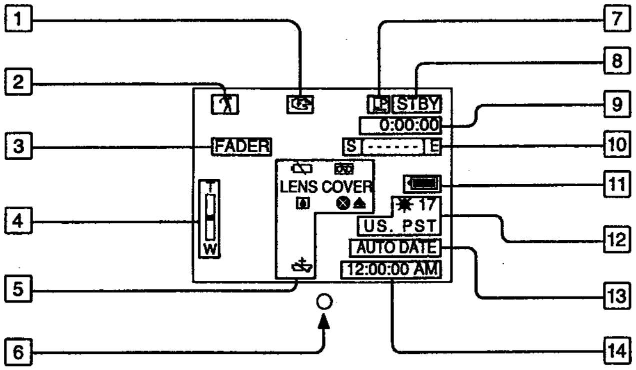
9 The lithium battery is weak or is not installed. (p. 11)

10 The LENS COVER switch is set to CLOSE.

Indicators in the Viewfinder

Operation Indicators

For details on each indicator, refer to the pages indicated in the parenthesis.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
LP
STBY
0:00:00
FADER
S
E
LENS COVER
T
W
17
US. PST
AUTO DATE
12:00:00 AM

1 Manual focusing (p. 27)

2 PROGRAM AE indicator (p. 28)

3 FADER indicator (p. 30)

4 Power zoom indicator (p. 18)

5 Warning indicators (p. 49)

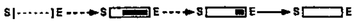
6 Recording lamp/Battery lamp

7 Lights up when playing back a tape recorded in LP mode

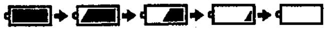
8 Tape transport mode (p. 16, 23)

9 Tape counter (p. 17)

10 Remaining tape length indicator



11 Remaining battery indicator (p. 8)



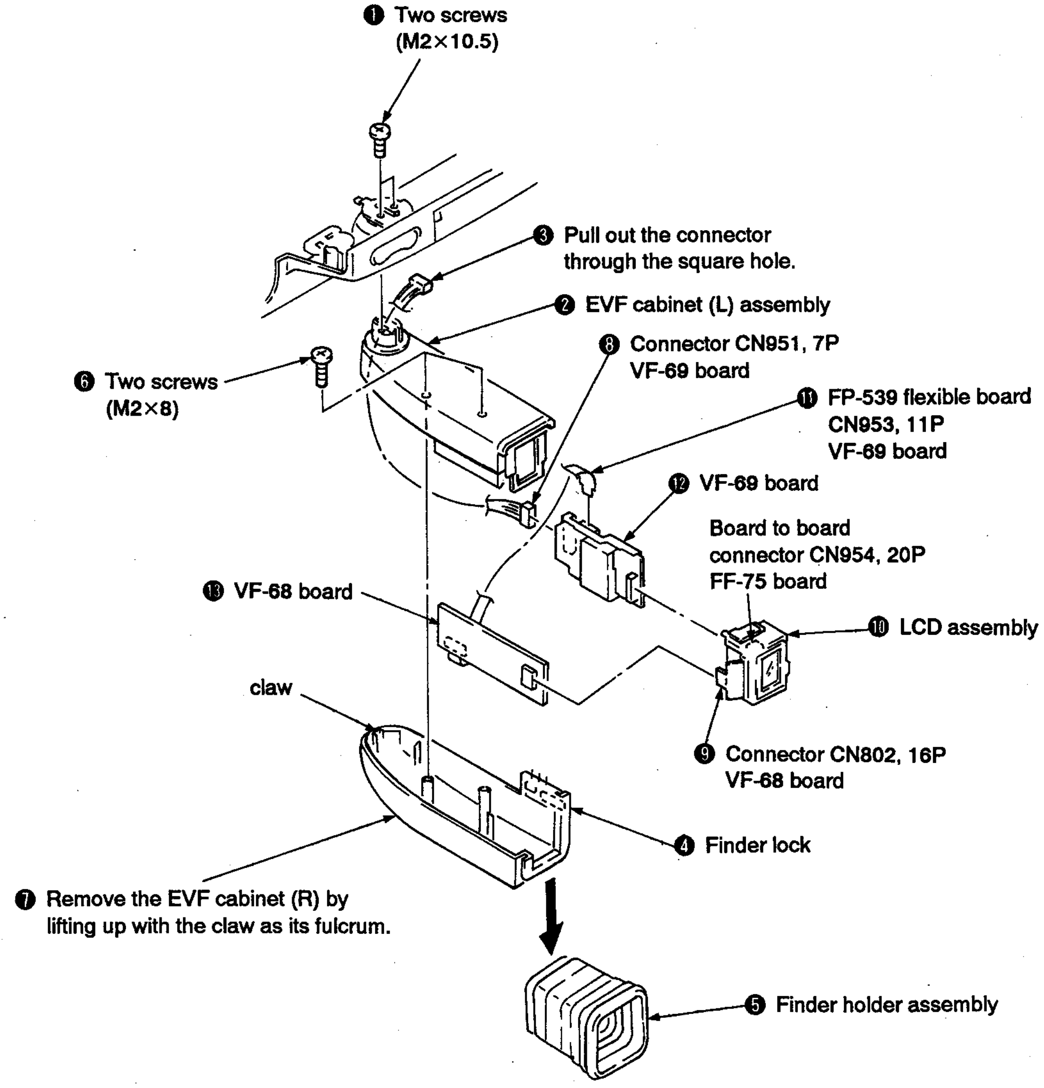
12 World clock indicator (p. 31)

13 AUTO DATE indicator (p. 16)

14 Date or Time (p. 12)

SECTION 2
DISASSEMBLY

2-13. REMOVAL OF EVF ASSEMBLY (VF-68 AND VF-69 BOARDS)


❶ Two screws
(M2×10.5)
❸ Pull out the connector
through the square hole.
❷ EVF cabinet (L) assembly
❽ Connector CN951, 7P
VF-69 board
❻ Two screws
(M2×8)
⓫ FP-539 flexible board
CN953, 11P
VF-69 board
⓬ VF-69 board
Board to board
connector CN954, 20P
FF-75 board
⓭ VF-68 board
❿ LCD assembly
claw
❾ Connector CN802, 16P
VF-68 board
❹ Finder lock
❼ Remove the EVF cabinet (R) by
lifting up with the claw as its fulcrum.
❺ Finder holder assembly

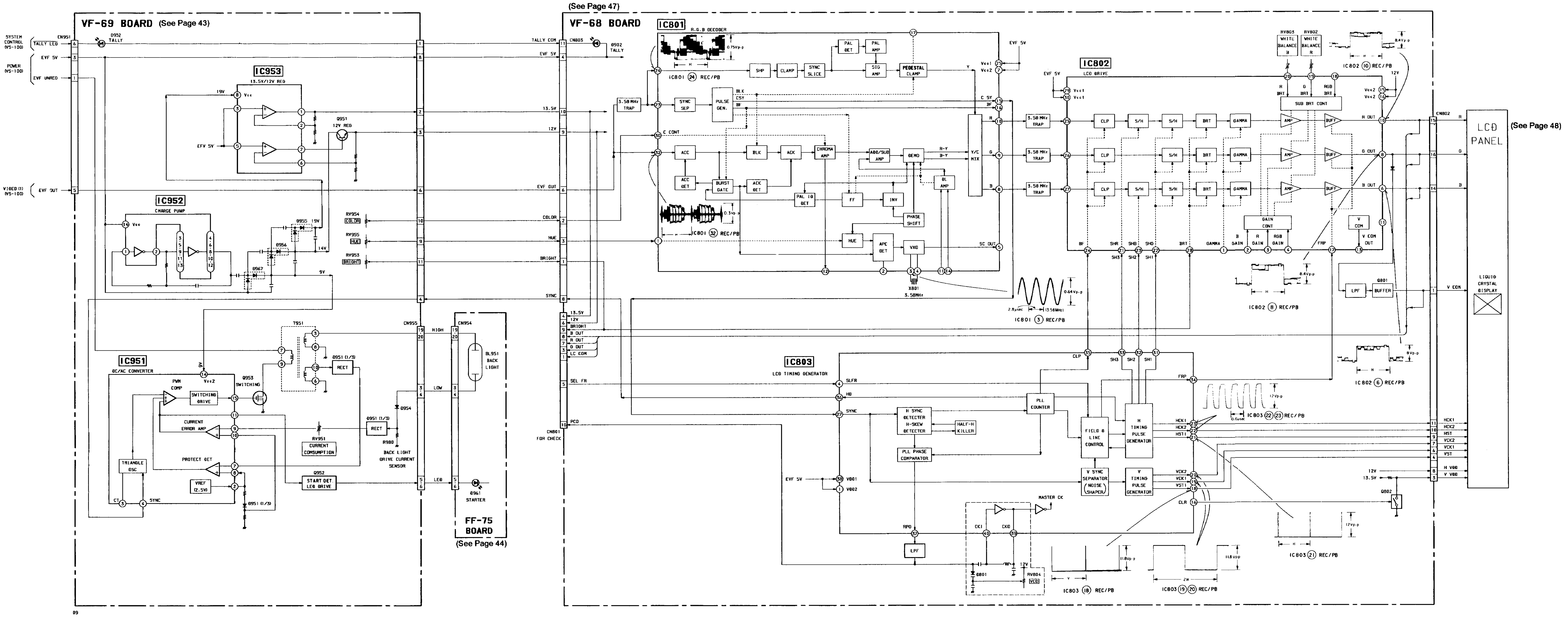
3-6. VIDEO (1) BLOCK DIAGRAM

< >: The pages above correspond to CCD-TR61/TR323 SERVICE MANUAL, ( ): Pages of CCD-TR65/TR353.

VS-100 BOARD
(See Page 34)
JK-99 BOARD
(See Page 123)
IC151
IC152
IC154
IC155
IC156
IC158
IC159
MAIN-EMPHASIS
SUB-EMPHASIS
NOISE CANSEL
Y COMB FILTER
Y/C MIX
COMB FILTER
CHROMA PROCESS
VIDEO OUT
S VIDEO OUT

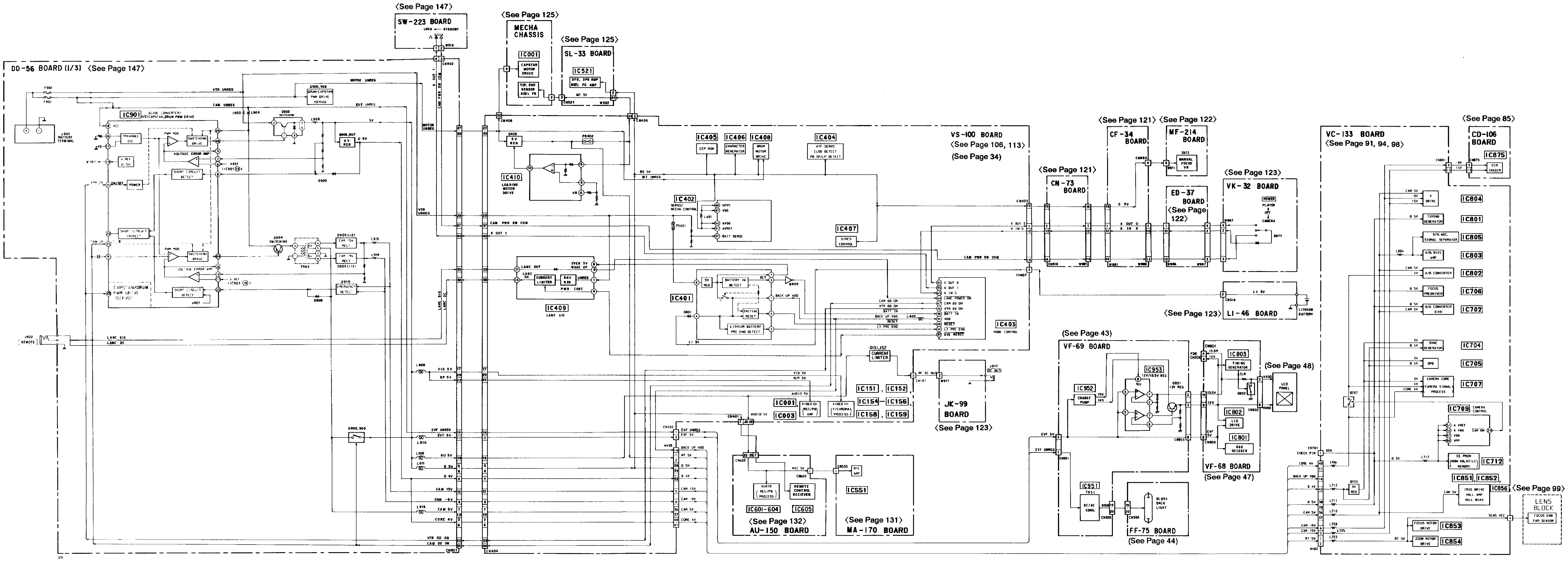
3-14. COLOR EVF BLOCK DIAGRAM

( ): The pages above correspond to CCD-TR65/TR353 SERVICE MANUAL


VF-69 BOARD (See Page 43)
(See Page 47)
VF-68 BOARD
FF-75 BOARD
(See Page 44)
LCD PANEL
(See Page 48)
SYSTEM CONTROL (VS-100)
POWER (VS-100)
VIDEO (1) (VS-100)
TALLY LED
EVF 5V
EVF UNREG
EVF OUT
IC953
13.5V/12V REG
IC952
CHARGE PUMP
IC951
DC/AC CONVERTER
PWM COMP
SWITCHING DRIVE
CURRENT ERROR AMP
PROTECT DET
TRIANGLE OSC
VREF (2.5V)
T951
RECT
RV951 CURRENT CONSUMPTION
START DET LED DRIVE
BACK LIGHT DRIVE CURRENT SENSOR
BL951 BACK LIGHT
STARTER
RV954 COLOR
RV955 HUE
RV953 BRIGHT
TALLY COM
13.5V
12V
COLOR
HUE
BRIGHT
SYNC
CN955
CN954
HIGH
LOW
LED
CN803
CN801 FOR CHECK
IC801
R.G.B DECODER
IC801 (24) REC/PB
IC801 (32) REC/PB
IC801 (3) REC/PB
3.58MHz TRAP
SYNC SEP
PULSE GEN.
SHP
CLAMP
SYNC SLICE
PAL DET
PAL AMP
SIG AMP
PEDESTAL CLAMP
C CONT
ACC
ACC DET
BURST GATE
ACK DET
BLK
ACK
CHROMA AMP
ABO/SUB AMP
DEMO
Y/C MIX
PAL ID DET
FF
INV
BL AMP
PHASE SHIFT
HUE
APC DET
VXO
X801 3.58MHz
IC802
LCD DRIVE
CLP
S/H
BRT
GAMMA
AMP
BUFF
SUB BRT CONT
GAIN CONT
V COM
RV803 WHITE BALANCE B
RV802 WHITE BALANCE R
IC802 (10) REC/PB
IC802 (8) REC/PB
IC802 (6) REC/PB
R OUT
G OUT
B OUT
LPF
BUFFER
Q801
Q802
IC803
LCD TIMING GENERATOR
SLFR
HD
SYNC
H SYNC DETECTER
H-SKEW DETECTER
HALF-H KILLER
PLL PHASE COMPARATOR
PLL COUNTER
FIELD & LINE CONTROL
H TIMING PULSE GENERATOR
V SYNC SEPARATOR (NOISE SHAPER)
V TIMING PULSE GENERATOR
MASTER CK
CK1
CK0
RPD
RV804 VCO
D801
IC803 (22)(23) REC/PB
IC803 (18) REC/PB
IC803 (19)(20) REC/PB
IC803 (21) REC/PB
HCK1
HCK2
HST
VCK2
VCK1
VST
V COM
H VDD
V VDD
CLR
LIQUID CRYSTAL DISPLAY
CN802
SEL FR
PCO

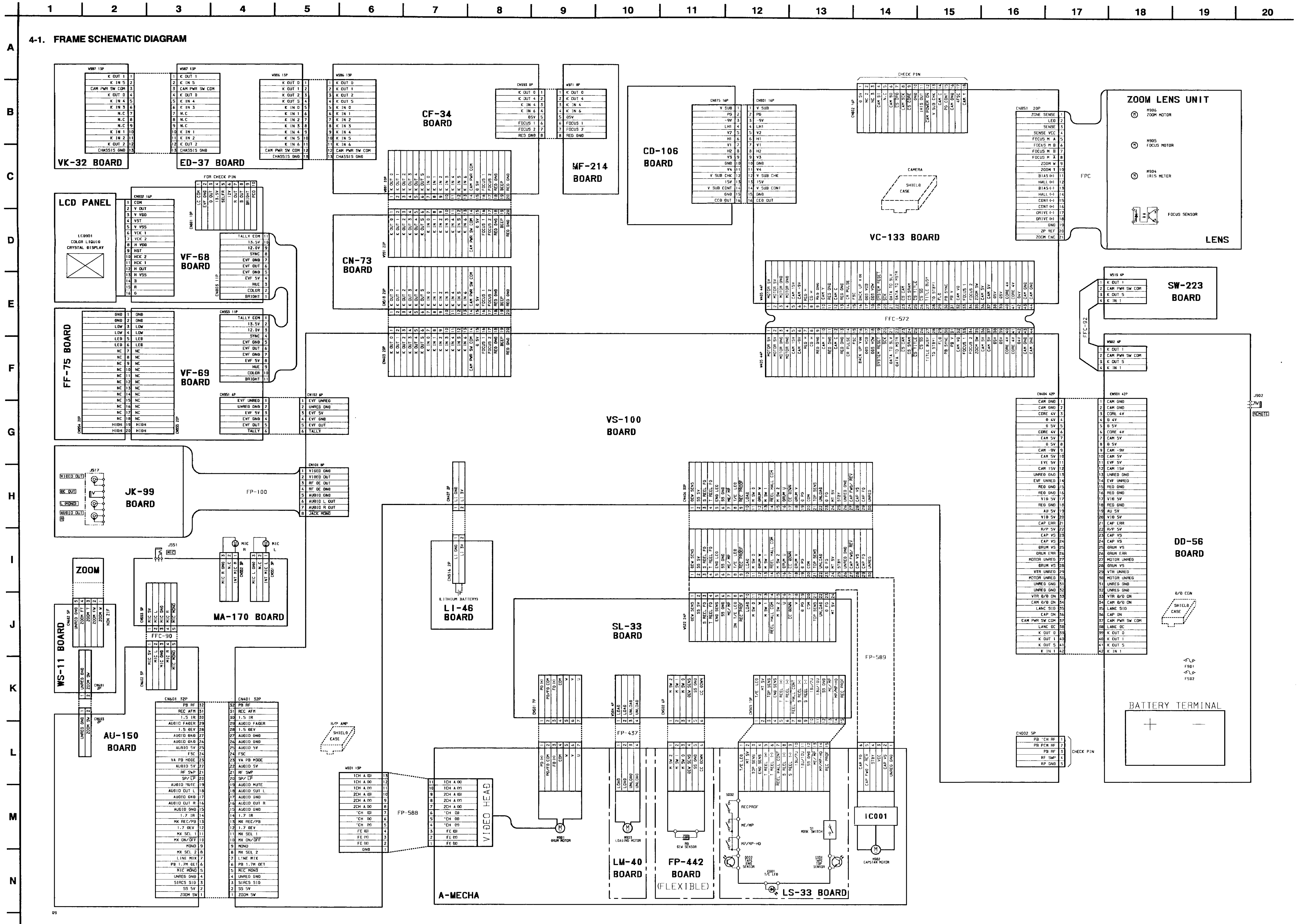
3-15. POWER BLOCK DIAGRAM

〈 〉: The pages above correspond to CCD-TR61/TR323 SERVICE MANUAL, ( ): Pages of CCD-TR65/TR353.


〈See Page 147〉
SW-223 BOARD
LOCK ← STANDBY
〈See Page 125〉
MECHA CHASSIS
IC001
CAPSTAN MOTOR DRIVE
TOP, END SENSOR REEL FG
〈See Page 125〉
SL-33 BOARD
IC521
DFG, DPG AMP REEL FG AMP
DD-56 BOARD (1/3) 〈See Page 147〉
J901 BATTERY TERMINAL
IC901 DC/DC CONVERTER/ VIDEO/CAPSTAN,DRUM PWM DRIVE
TRIANGLE OSC
PWM MOD
SWITCHING DRIVE
VOLTAGE ERROR AMP
SHORT CIRCUIT DETECT
POWER
SHORT CIRCUIT PROTECT
CAPSTAN/DRUM PWM DRIVE
Q905,906 DRUM/CAPSTAN PWM DRIVE (SERVO)
Q908 SWITCHING
Q906,907 4V REG
Q904 SWITCHING
T901
D901 CAM 15V RECT
CAM -9V RECT
Q910 EMERGENCY DETECT
Q902,903
J902 REMOTE
LANC SIG
LANC DC
VTR UNREG
CAM UNREG
MOTOR UNREG
EVF UNREG
CAM PWR SW CON
K OUT 1
VIO 5V
RP 5V
EVF 5V
AU 5V
D 5V
D 4V
CAM 15V
CAM -9V
CAM 5V
CORE 4V
VTR DD ON
CAM DD ON
CN901
CN404
CN406
Q409 5V REG
PS402
IC410 LOADING MOTOR DRIVE
IC409 LANC I/O
LANC OUT
LANC DC
CURRENT LIMITER
EVER 5V
WAKE UP
5.4V REG
UNREG
PWR CONT
VS-100 BOARD
〈See Page 106, 113〉
(See Page 34)
IC405 EEP ROM
IC406 CHARACTER GENERATOR
IC408 DRUM MOTOR DRIVE
IC404 ATF SERVO CLOG DETECT PB SP/LP DETECT
IC402 SERVO/ MECHA CONTROL
IC407 SIRCS CONTROL
IC401
5V REG
BATTERY IN DETECT
BACK UP VDD
INITIAL RESET
LITHIUM BATTERY PRE END DETECT
IC403 MODE CONTROL
Q151,152 CURRENT LIMITER
IC151, IC152
IC154, IC156
IC158, IC159
IC001 VIDEO (2) (REC/PB) AMP
IC003 VIDEO (1) (Y/CHROMA) PROCESS
CN401
CN102
AU-150 BOARD
〈See Page 132〉
IC601-604 AUDIO (REC/PB) PROCESS
IC605 REMOTE CONTROL RECIEVER
MA-170 BOARD
〈See Page 131〉
MIC AMP
IC551
JK-99 BOARD
〈See Page 123〉
J517 DC IN
〈See Page 121〉
CN-73 BOARD
〈See Page 121〉
CF-34 BOARD
〈See Page 122〉
MF-214 BOARD
S972 MANUAL FOCUS VR
ED-37 BOARD
〈See Page 122〉
〈See Page 123〉
VK-32 BOARD
POWER PLAYER OFF CAMERA
S977
〈See Page 123〉
LI-46 BOARD
LITHIUM BATTERY
〈See Page 43〉
VF-69 BOARD
IC952 CHARGE PUMP
IC953 12V/13.5V REG
Q951 12V REG
IC951 T951 DC/AC CONV.
FF-75 BOARD
(See Page 44)
BL951 BACK LIGHT
VF-68 BOARD
(See Page 47)
IC803 TIMING GENERATOR
IC802 LCD DRIVE
IC801 RGB DECODER
(See Page 48)
LCD PANEL
VC-133 BOARD
〈See Page 91, 94, 98〉
〈See Page 85〉
CD-106 BOARD
IC875 CCD IMAGER
IC804 V DRIVE
IC801 TIMING GENERATOR
IC805 S/H AGC SIGNAL SEPARATOR
IC803 A/D BIAS AMP
IC802 A/D CONVERTER
IC706 FOCUS PREDRIVER
IC702 D/A CONVERTER
IC704 SYNC GENERATOR
IC705 DPG
IC707 CAMERA CORE CAMERA SIGNAL PROCESS
IC709 CAMERA CONTROL
IC712 EE PROM (NON-VOLATILE) MEMORY
IC851, IC852, IC856 IRIS DRIVE HALL AMP HALL BIAS
IC853 FOCUS MOTOR DRIVE
IC854 ZOOM MOTOR DRIVE
〈See Page 99〉
LENS BLOCK
FOCUS END FAR SENSOR
CN701 CHECK PIN

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
A
B
C
D
E
F
G
H
I
J
K
L
M
N
VK-32 BOARD
ED-37 BOARD
CF-34 BOARD
MF-214 BOARD
CD-106 BOARD
VC-133 BOARD
ZOOM LENS UNIT
M906 ZOOM MOTOR
M905 FOCUS MOTOR
M904 IRIS METER
FOCUS SENSOR
LENS
FPC
CHECK PIN
CAMERA SHIELD CASE
LCD PANEL
VF-68 BOARD
FOR CHECK PIN
CN-73 BOARD
FF-75 BOARD
VF-69 BOARD
FFC-572
SW-223 BOARD
FFC-92
VS-100 BOARD
JK-99 BOARD
FP-100
VIDEO OUT
RK OUT
S VIDEO OUT
AUDIO OUT
MIC R
MIC L
MA-170 BOARD
FFC-90
ZOOM
WS-11 BOARD
LI-46 BOARD
LITHIUM BATTERY
DD-56 BOARD
D/D CON SHIELD CASE
SL-33 BOARD
FP-589
BATTERY TERMINAL
AU-150 BOARD
R/P AMP SHIELD CASE
FP-588
VIDEO HEAD
M901 DRUM MOTOR
FP-437
M903 LOADING MOTOR
LM-40 BOARD
FP-442 BOARD (FLEXIBLE)
DEW SENSOR
LS-33 BOARD
REC PROOF
IC001
M902 CAPSTAN MOTOR
A-MECHA

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing.
  (The other layers'patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- Through hole is omitted.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in µF unless otherwise noted. pF: µµF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊞ : nonflammable resistor.
- ⊟ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repeair.*
- ━━ : B+ Line.*
- ╍╍ : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

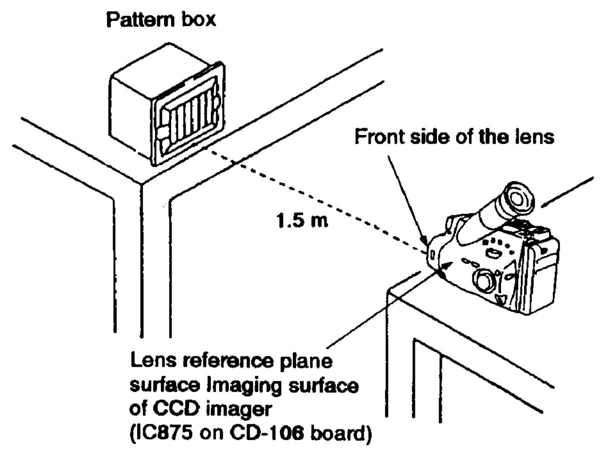
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

*: indicated by the color red.

- **Measuring conditions voltage value and waveform.**
(CAMERA REC mode)
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.*
  Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC875 on CD-106 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

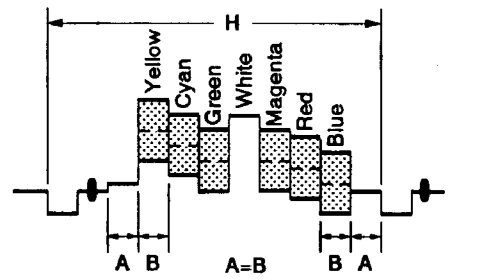

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A=B
B
A

Fig. a (Video output terminal output waveform)

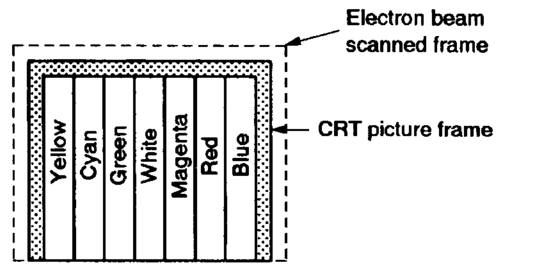

Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. b (Picture on monitor TV)

(REC/PB mode)
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing.
  (The other layers'patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- Through hole is omitted.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ⏛ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.*
- ━━ : B+ Line.*
- ‐‐‐ : B– Line.*
- ⇛ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

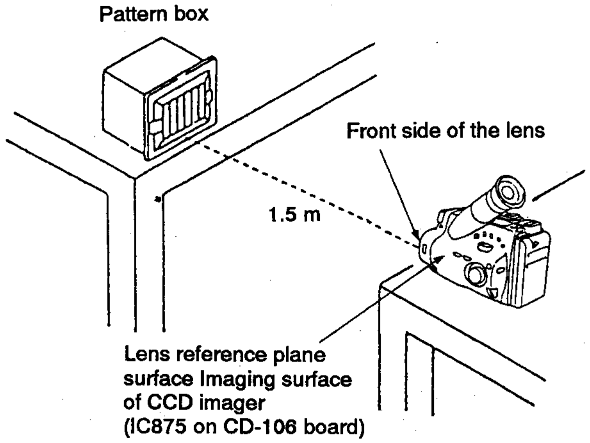
When indicating parts by reference number, please include the board name.

*: indicated by the color red.

• Measuring conditions voltage value and waveform.
(CAMERA REC mode)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.*
  Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

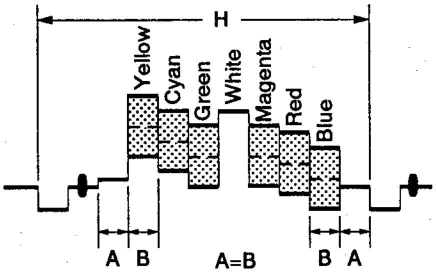


Fig. a (Video output terminal output waveform)

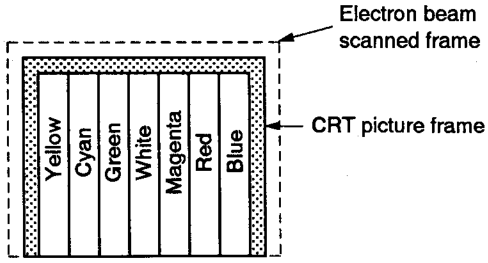
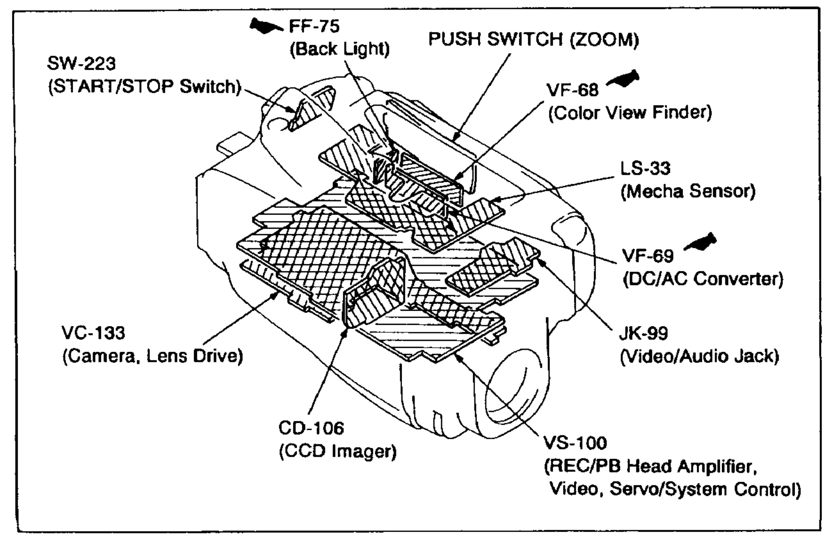


Fig. b (Picture on monitor TV)

(REC/PB mode)

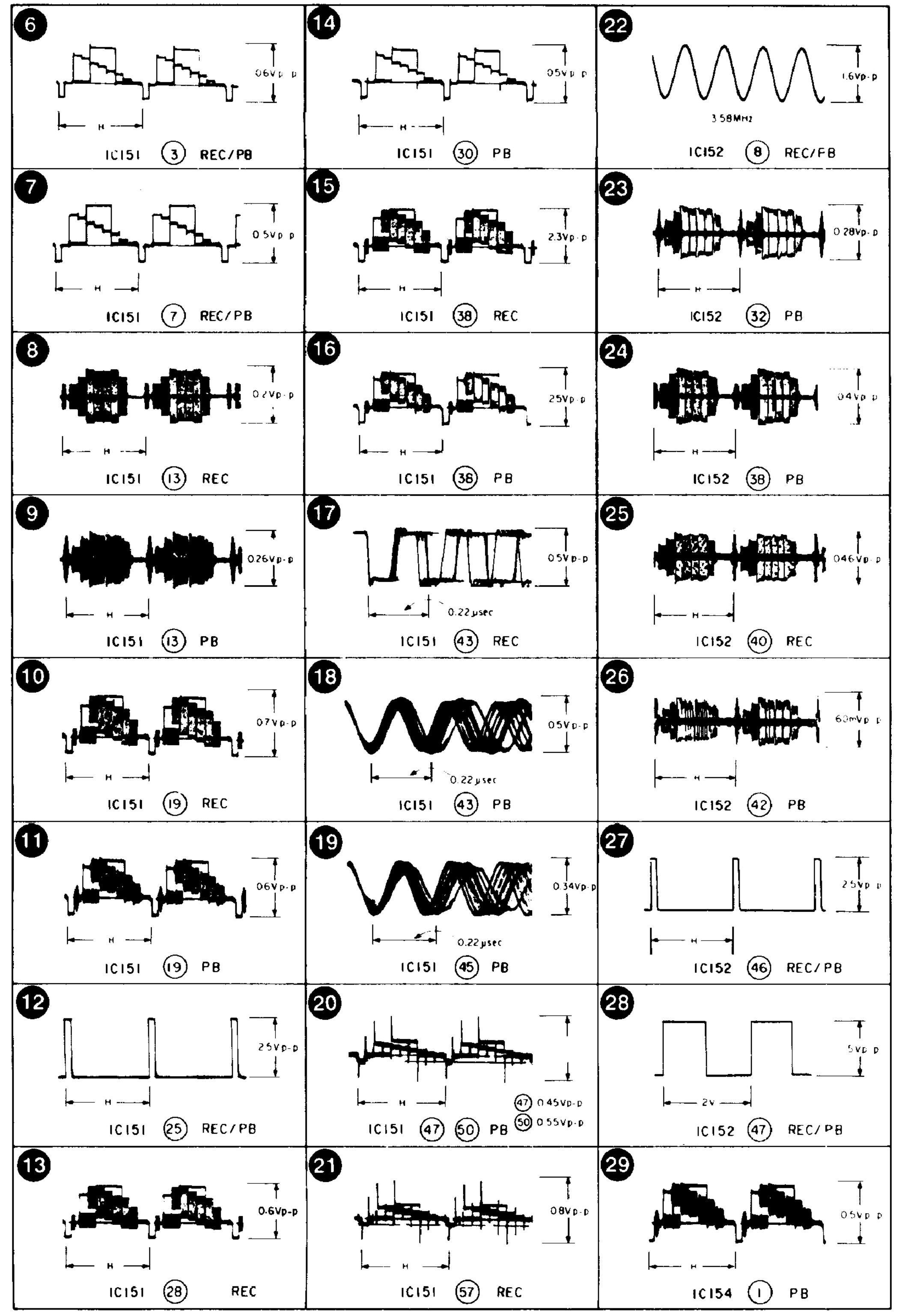
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*


FF-75
(Back Light)
PUSH SWITCH (ZOOM)
SW-223
(START/STOP Switch)
VF-68
(Color View Finder)
LS-33
(Mecha Sensor)
VF-69
(DC/AC Converter)
VC-133
(Camera, Lens Drive)
JK-99
(Video/Audio Jack)
CD-106
(CCD Imager)
VS-100
(REC/PB Head Amplifier,
Video, Servo/System Control)

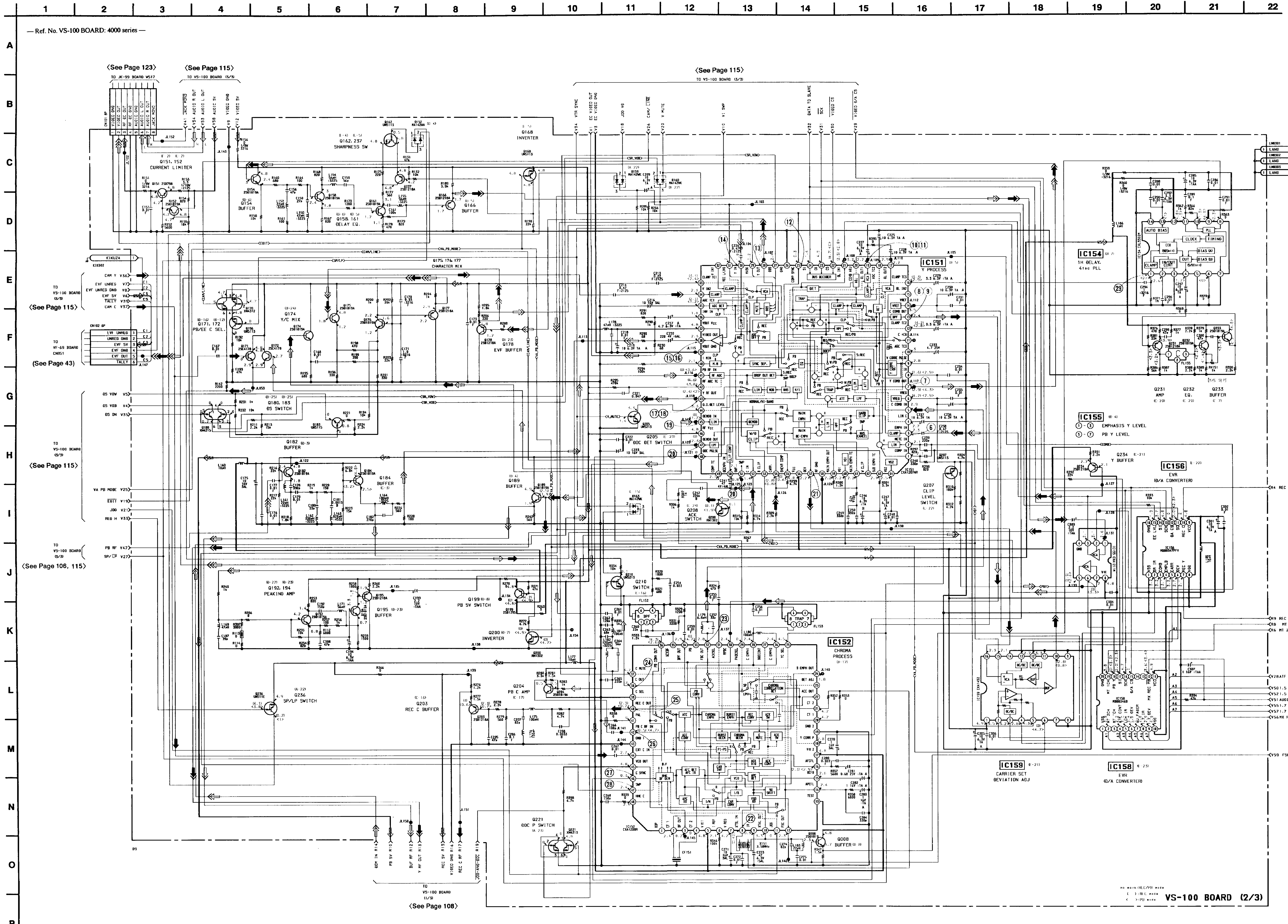
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡⋙	
PB	⇨	⇨≫	⇨⋙	⇨

VS-100 BOARD(2/3)



VS-100 (VIDEO) SCHEMATIC DIAGRAM　　〈 〉: The pages above correspond to CCD-TR61/TR323 SERVICE MANUAL, ( ): Pages of CCD-TR65/TR353.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
— Ref. No. VS-100 BOARD: 4000 series —
〈See Page 123〉
TO JK-99 BOARD W517
〈See Page 115〉
TO VS-100 BOARD (3/3)
〈See Page 115〉
TO VS-100 BOARD (3/3)
Q151, 152
CURRENT LIMITER
Q162, 237
SHARPNESS SW
Q168
INVERTER
Q154
BUFFER
Q158, 161
DELAY EQ.
Q166
BUFFER
Q175, 176, 177
CHARACTER MIX
TO VS-100 BOARD (3/3)
〈See Page 115〉
Q171, 172
PB/EE C SEL.
Q174
Y/C MIX
Q178
EVF BUFFER
TO VF-69 BOARD CN951
〈See Page 43〉
Q180, 183
DS SWITCH
Q182
BUFFER
TO VS-100 BOARD (3/3)
〈See Page 115〉
Q184
BUFFER
Q189
BUFFER
TO VS-100 BOARD (3/3)
〈See Page 106, 115〉
Q192, 194
PEAKING AMP
Q195
BUFFER
Q199
PB SV SWITCH
Q200
INVERTER
Q236
SP/LP SWITCH
Q203
REC C BUFFER
Q204
PB C AMP
Q221
DOC P SWITCH
TO VS-100 BOARD (3/3)
〈See Page 108〉
Q205
DOC DET SWITCH
Q208
ACK SWITCH
Q210
SWITCH
IC151
Y PROCESS
IC152
CHROMA PROCESS
Q008
BUFFER
IC154
1H DELAY, 64sec PLL
Q231
AMP
Q232
EQ.
Q233
BUFFER
IC155
①-⑤ EMPHASIS Y LEVEL
⑤-⑦ PB Y LEVEL
Q234
Y BUFFER
IC156
EVR
(D/A CONVERTER)
Q207
CLIP LEVEL SWITCH
TO VS-100 BOARD (3/3)
〈See Page 108〉
TO VS-100 BOARD (3/3)
〈See Page 115〉
V51 AUDIO FADER
V55 1.7 IR
V57 1.7 DEV
V56 MX REC/PB
V59 FSC
IC159
CARRIER SET
DEVIATION ADJ
IC158
EVR
(D/A CONVERTER)
no mark: REC/PB mode
( ): REC mode
< >: PB mode
VS-100 BOARD (2/3)

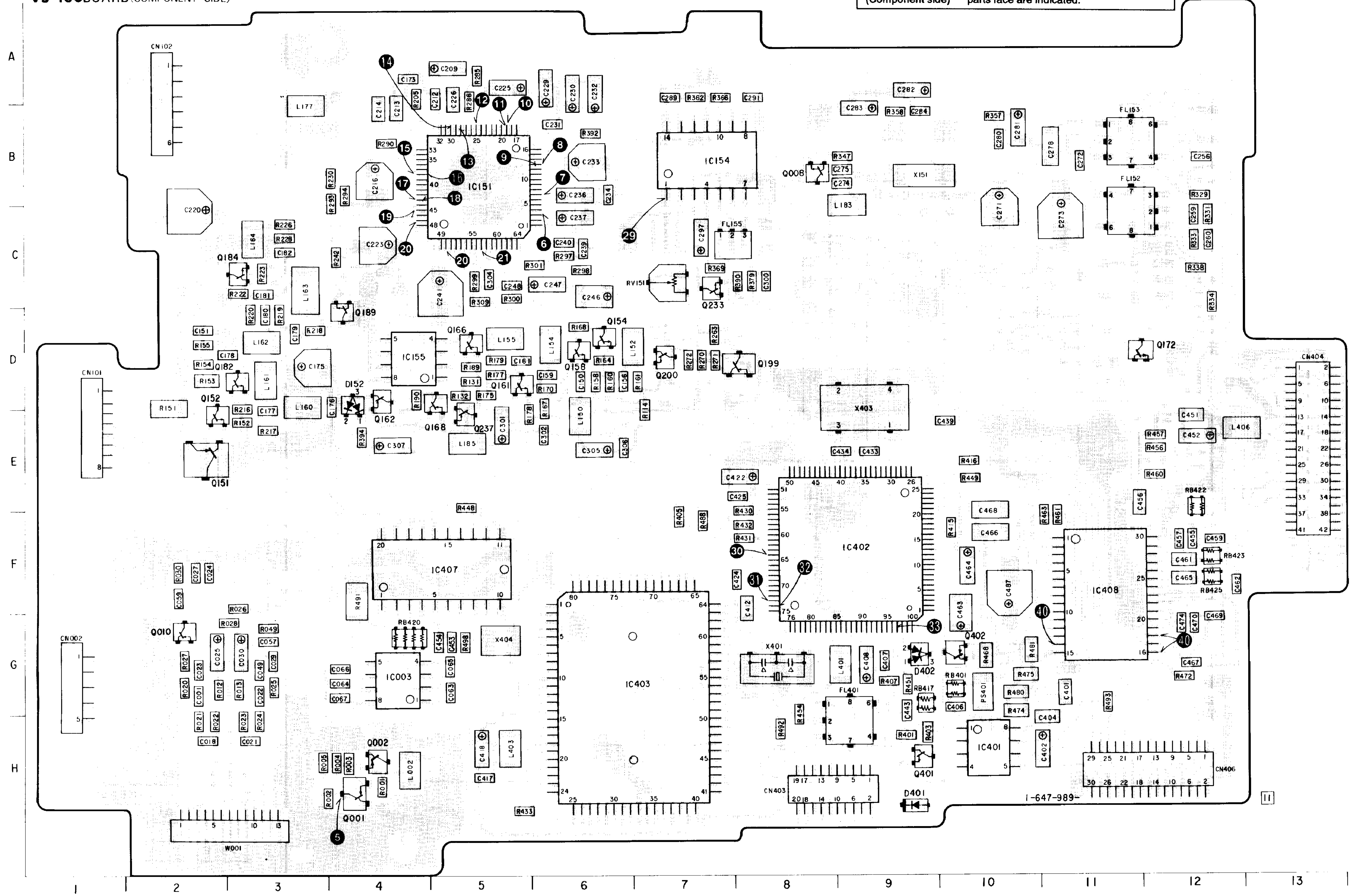
VS-100 (REC/PB HEAD AMP, VIDEO, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARD

— Ref. No. VS-100 BOARD: 4000 series —

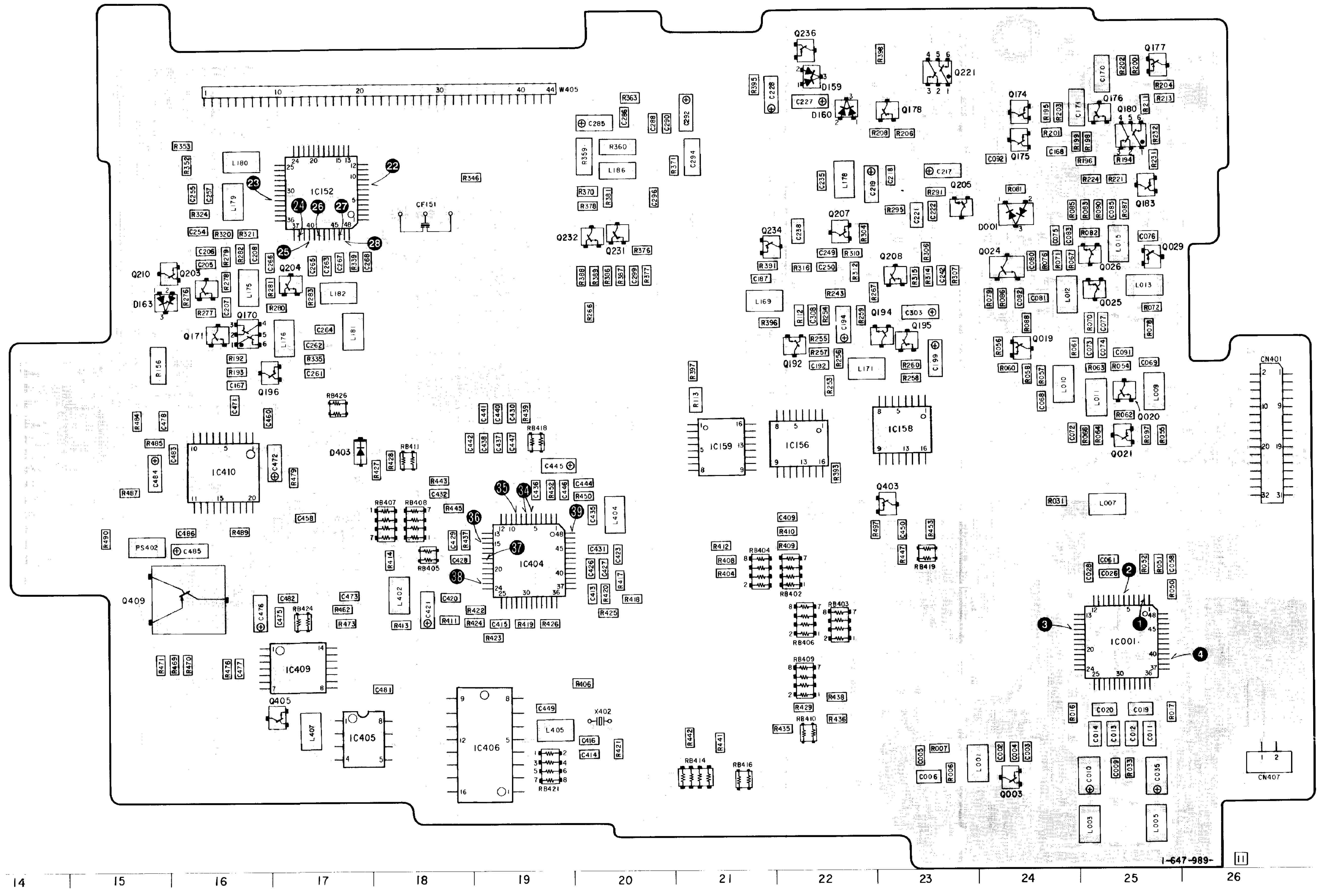
- **For printed wiring boards.**
- VS-100 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

VS-100BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
CN102
CN101
CN002
IC151
IC154
IC155
IC407
IC003
IC403
IC402
IC408
IC401
X151
X403
X404
X401
FL153
FL152
FL155
FL401
RV151
CN404
CN403
CN406
W001
Q151
Q001
Q002
Q010
Q184
Q189
Q152
Q162
Q168
Q166
Q161
Q156
Q154
Q200
Q199
Q233
Q008
Q172
Q401
Q402
D152
D401
D402
1-647-989-
1
2
3
4
5
6
7
8
9
10
11
12
13

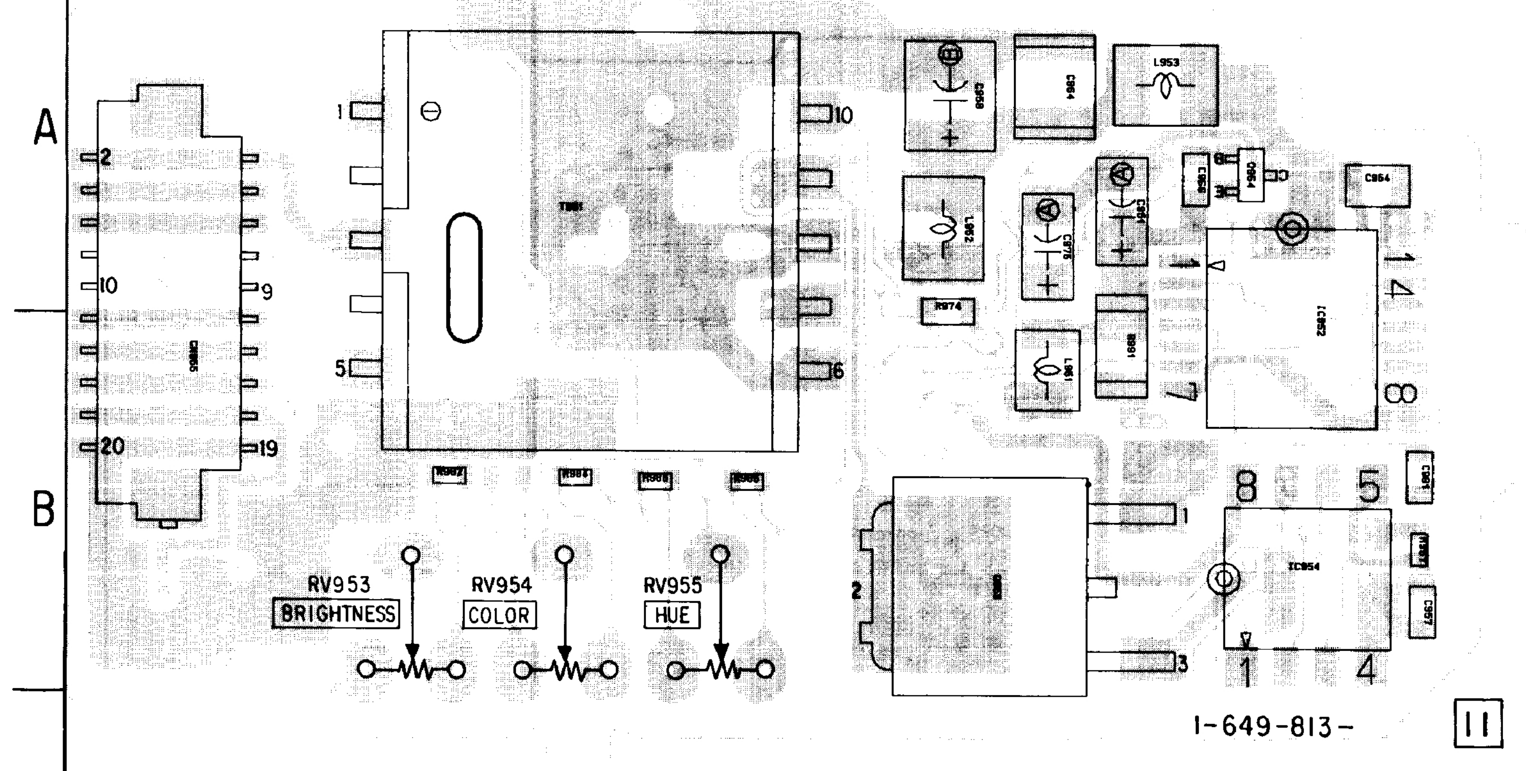
VS-100BOARD (CONDUCTOR SIDE)


W405
IC152
IC410
IC404
IC409
IC405
IC406
IC159
IC156
IC158
IC001
CF151
PS402
CN401
CN407
Q409
Q405
Q403
Q003
Q236
Q159
Q160
Q221
Q177
Q178
Q174
Q175
Q176
Q180
Q183
Q205
Q207
Q208
Q194
Q195
Q192
Q234
Q231
Q232
Q210
Q203
Q204
Q170
Q171
Q196
Q024
Q026
Q025
Q029
Q019
Q020
Q021
D001
D163
D403
X402
1-647-989-
14
15
16
17
18
19
20
21
22
23
24
25
26

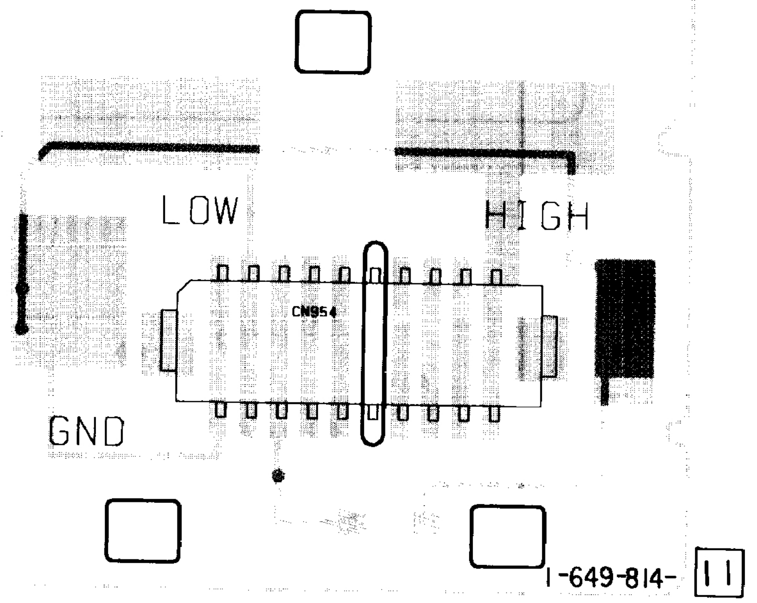
VF-69 (DC/AC CONVERTER), FF-75 (BACK LIGHT) PRINTED WIRING BOARDS

— Ref. No. VF-69 BOARD: 2000 series, FF-75 BOARD: 3000 series —

VF-69 BOARD (COMPONENT SIDE)


A
B
RV953
BRIGHTNESS
RV954
COLOR
RV955
HUE
1-649-813-
11

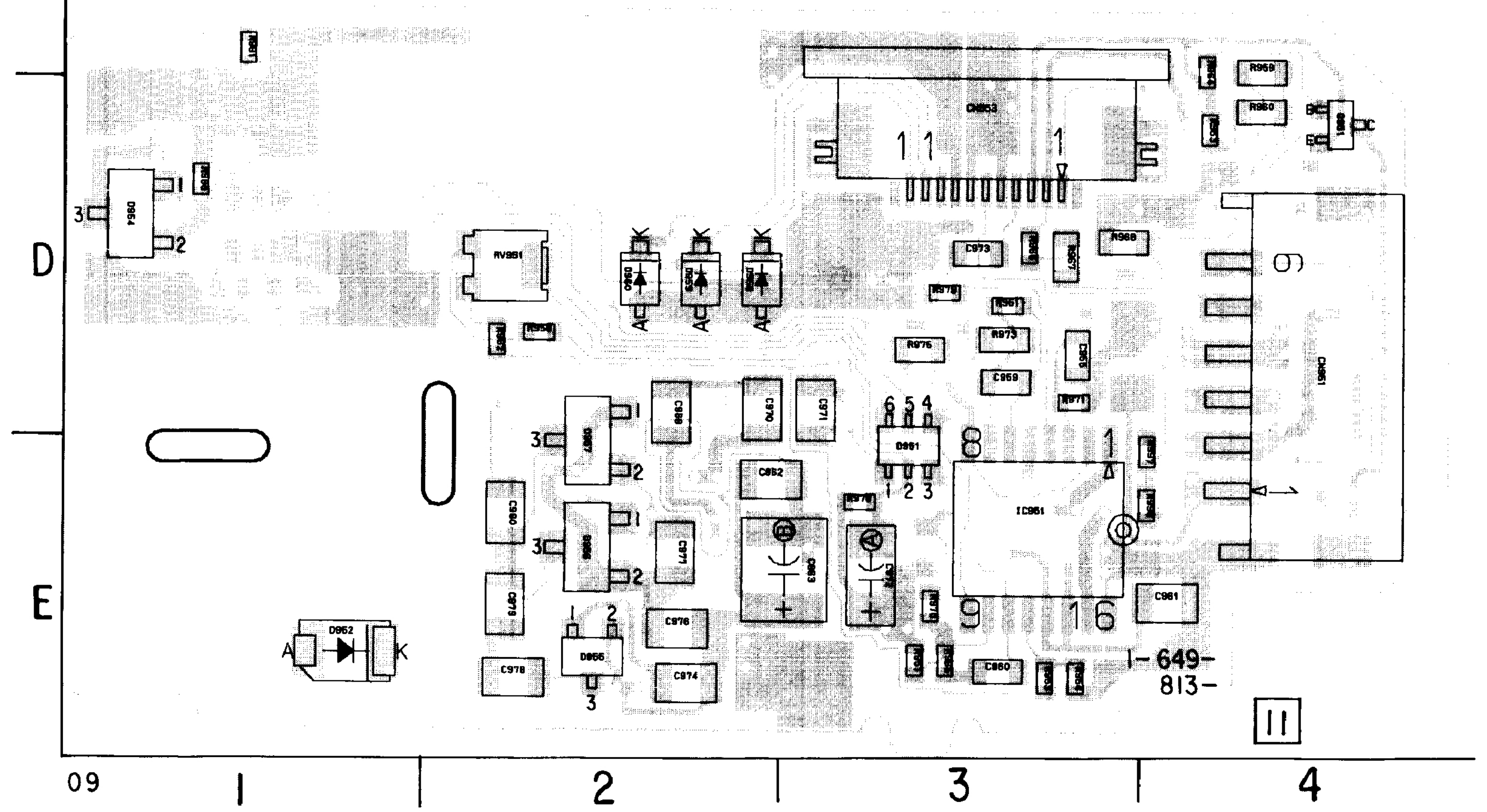
FF-75 BOARD (COMPONENT SIDE)

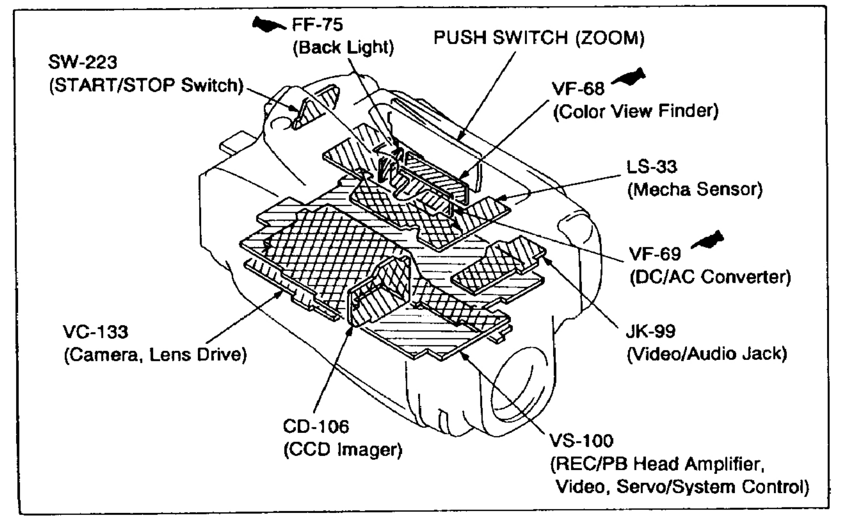

LOW
HIGH
GND
CN954
1-649-814-
11

- **For printed wiring board of FF-75 board.**
- ● : Through hole is omitted.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.

(The other layer's patterns are not indicated.)

VF-69 BOARD (CONDUCTOR SIDE)


C
D
E
09
1
2
3
4
1-649-813-
11


FF-75
(Back Light)
PUSH SWITCH (ZOOM)
SW-223
(START/STOP Switch)
VF-68
(Color View Finder)
LS-33
(Mecha Sensor)
VF-69
(DC/AC Converter)
VC-133
(Camera, Lens Drive)
JK-99
(Video/Audio Jack)
CD-106
(CCD Imager)
VS-100
(REC/PB Head Amplifier,
Video, Servo/System Control)

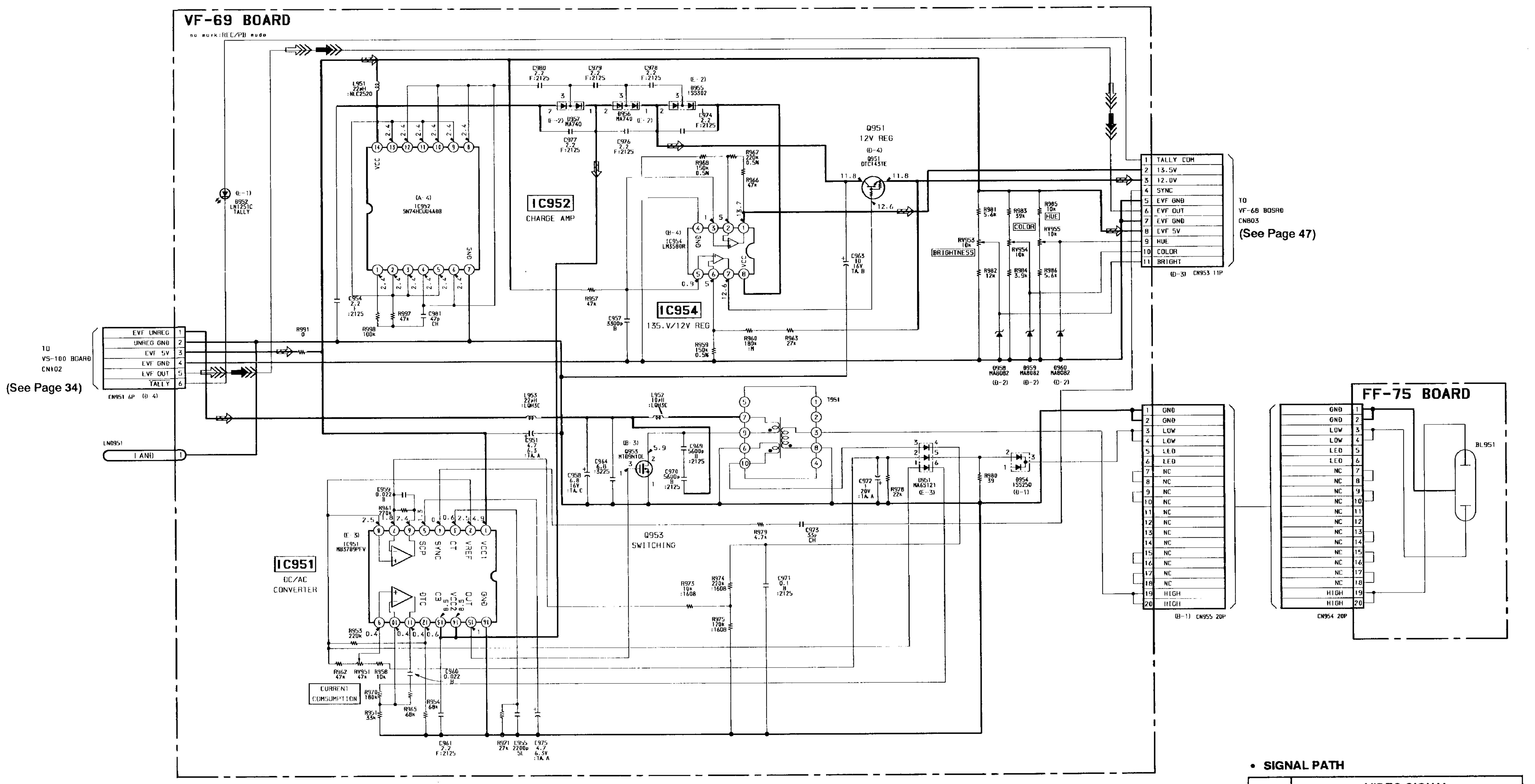
- **For printed wiring boards.**
- **VF-69 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.**
- ● : Through hole is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

VF-69 (DC/AC CONVERTER), FF-75 (BACK LIGHT) SCHEMATIC DIAGRAMS

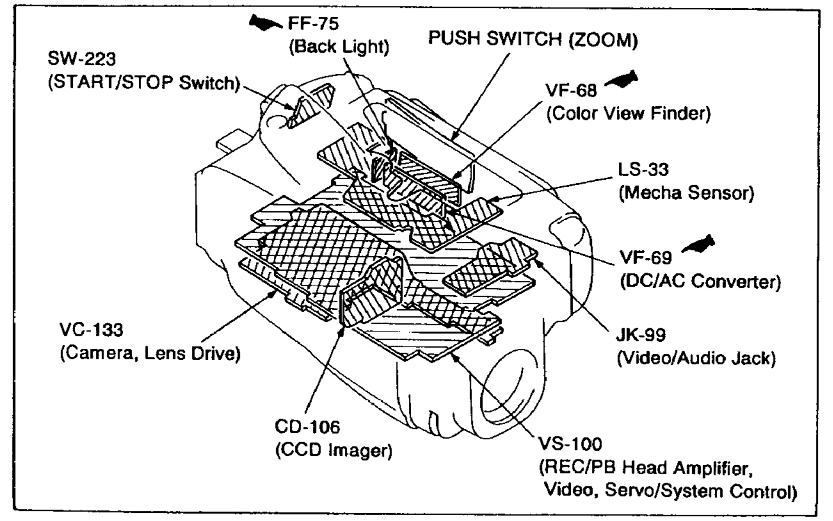
( ): The pages above correspond to CCD-TR65/TR353 SERVICE MANUAL.

— Ref. No. VF-69 BOARD: 2000 series, FF-75 BOARD: 3000 series —

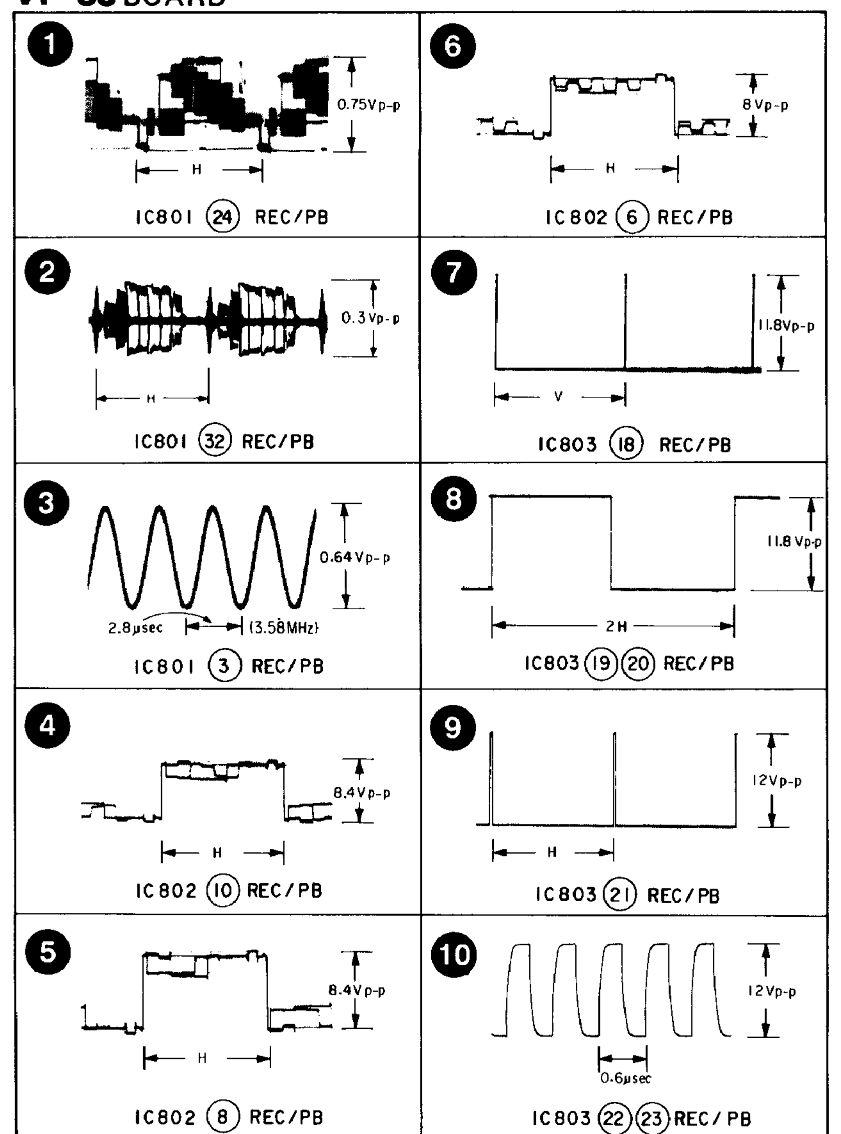

VF-69 BOARD
TO
VS-100 BOARD
CN102
(See Page 34)
EVF UNREG
UNREG GND
EVF 5V
EVF GND
EVF OUT
TALLY
CN951 6P
LND951
LAND
IC952
CHARGE AMP
IC954
13.5V/12V REG
Q951
12V REG
IC951
DC/AC
CONVERTER
Q953
SWITCHING
BRIGHTNESS
COLOR
HUE
TO
VF-68 BOARD
CN803
(See Page 47)
FF-75 BOARD
CN954 20P
CN955 20P

- **SIGNAL PATH**

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			➡≫
PB			⇨≫


FF-75
(Back Light)
PUSH SWITCH (ZOOM)
SW-223
(START/STOP Switch)
VF-68
(Color View Finder)
LS-33
(Mecha Sensor)
VF-69
(DC/AC Converter)
VC-133
(Camera, Lens Drive)
JK-99
(Video/Audio Jack)
CD-106
(CCD Imager)
VS-100
(REC/PB Head Amplifier,
Video, Servo/System Control)

VF-68 BOARD

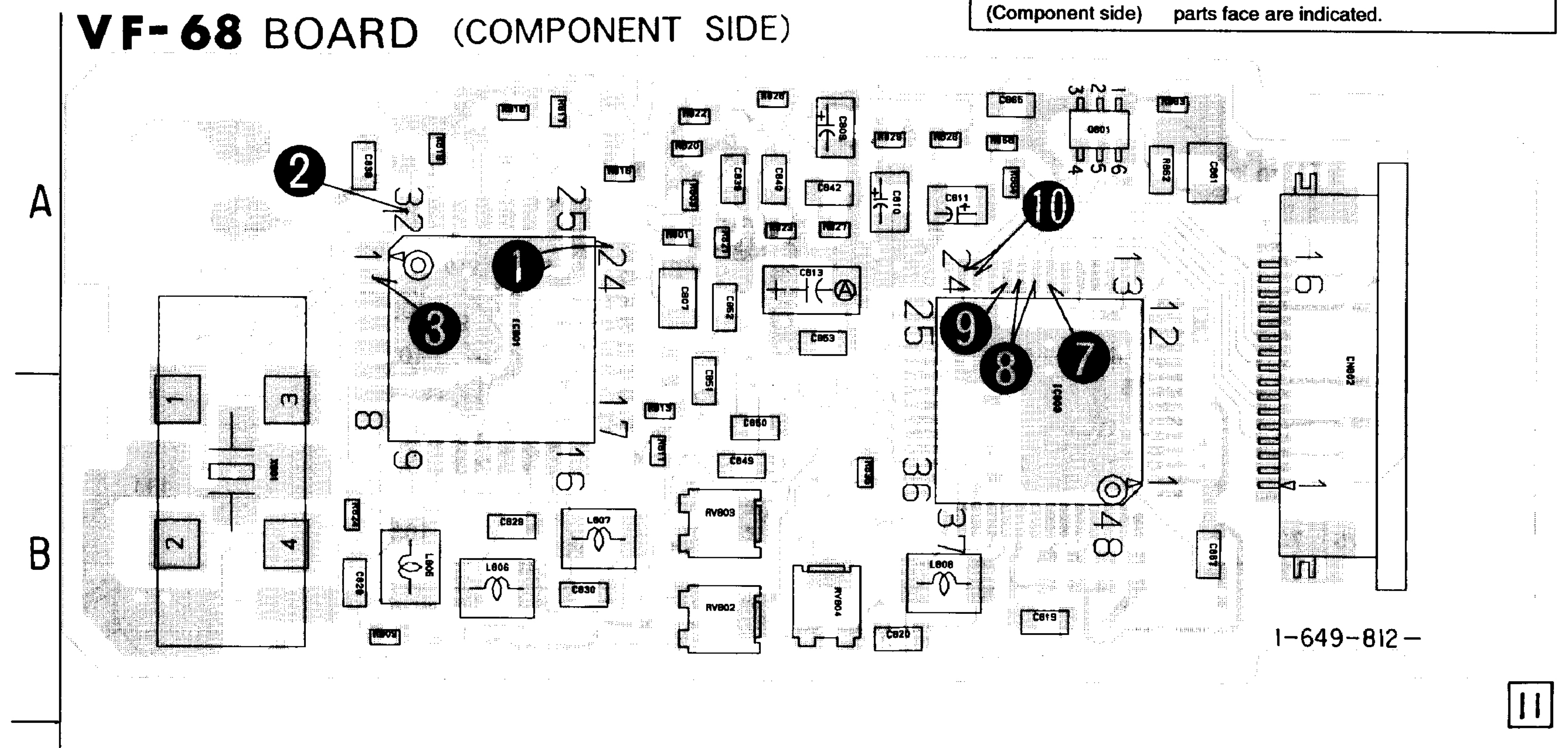


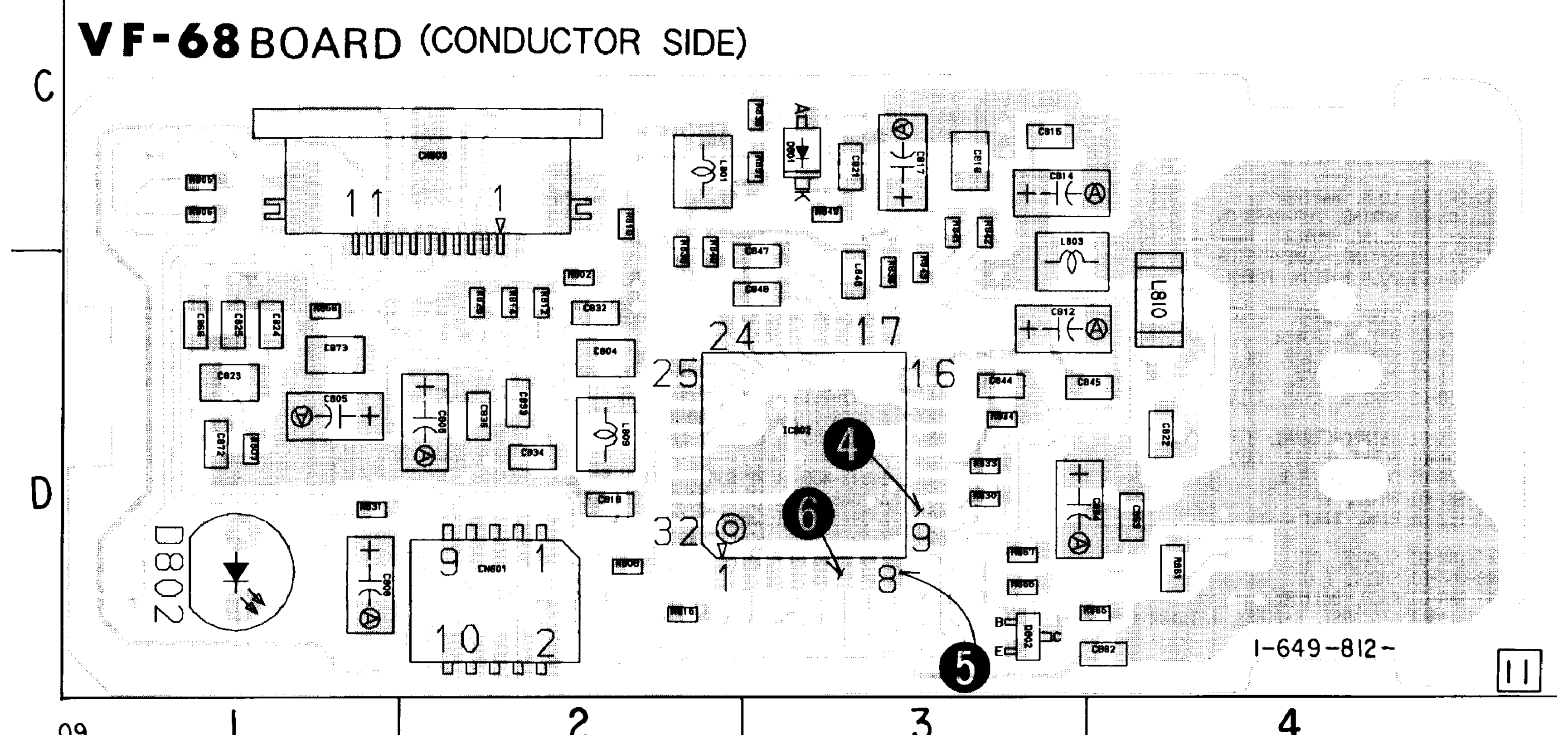
VF-68 (COLOR VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-68 BOARD: 2000 series —

- **For printed wiring boards.**
- VF-68 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

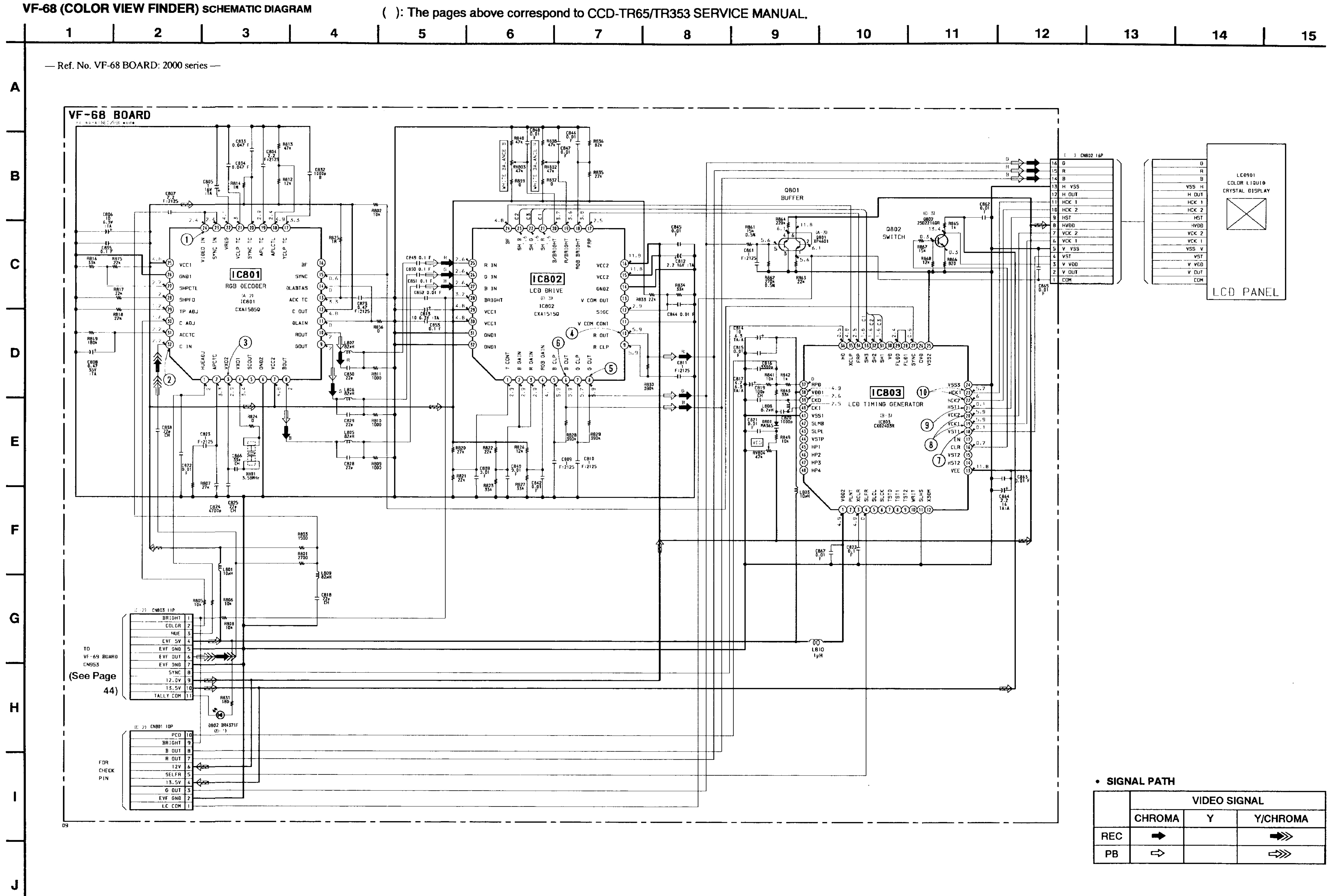
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.


VF-68 BOARD (COMPONENT SIDE)
A
B
1
2
3
8
9
16
17
24
25
32
36
48
12
13
24
25
1
2
3
4
5
6
7
8
9
10
1-649-812-
11


VF-68 BOARD (CONDUCTOR SIDE)
C
D
11
1
24
17
25
16
32
1
8
9
4
5
6
9
1
10
2
D802
L810
1-649-812~
11
09
1
2
3
4

VF-68 (COLOR VIEW FINDER) SCHEMATIC DIAGRAM

( ): The pages above correspond to CCD-TR65/TR353 SERVICE MANUAL.

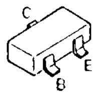

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
— Ref. No. VF-68 BOARD: 2000 series —
VF-68 BOARD
IC801
RGB DECODER
CXA1585Q
IC802
LCD DRIVE
CXA1515Q
IC803
LCD TIMING GENERATOR
CXD2403R
Q801
BUFFER
Q802
SWITCH
CN802 16P
LCD901
COLOR LIQUID
CRYSTAL DISPLAY
LCD PANEL
CN803 11P
BRIGHT
COLOR
HUE
EVF 5V
EVF GND
EVF OUT
EVF GND
SYNC
12.0V
13.5V
TALLY COM
TO
VF-69 BOARD
CN953
(See Page
44)
CN801 10P
PCO
BRIGHT
B OUT
R OUT
12V
SELFR
13.5V
G OUT
EVF GND
LC COM
FOR
CHECK
PIN
D802 BR4371F
X801 3.58MHz
09

- **SIGNAL PATH**

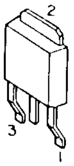
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡		➡≫
PB	⇨		⇨≫

4-3. SEMICONDUCTORS

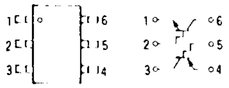
DTA123JE
DTC143TE-TL
2SD2216Q



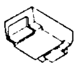
MTD9N10E



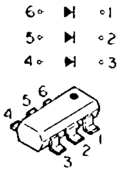
XP4601



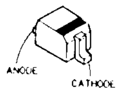
LN1251C



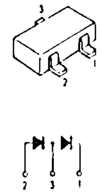
MA1S121



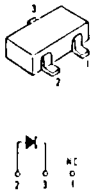
MA365
MA8082-M


ANODE
CATHODE

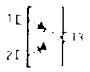
MA740



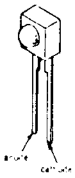
1SS250



1SS302



BR4371F


anode
cathode

SECTION 5

EXPLODED VIEWS

NOTE:

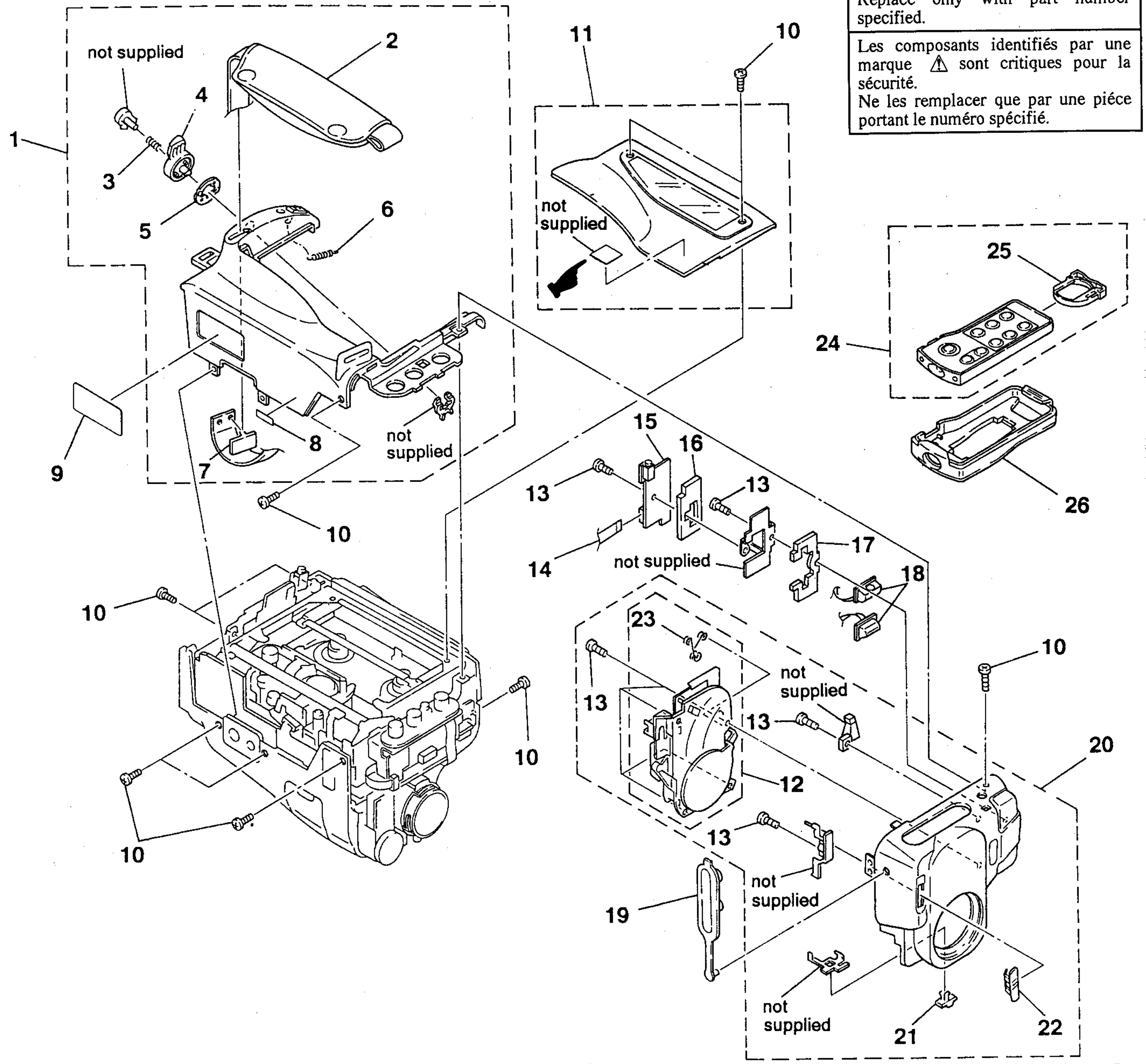
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Page. 151

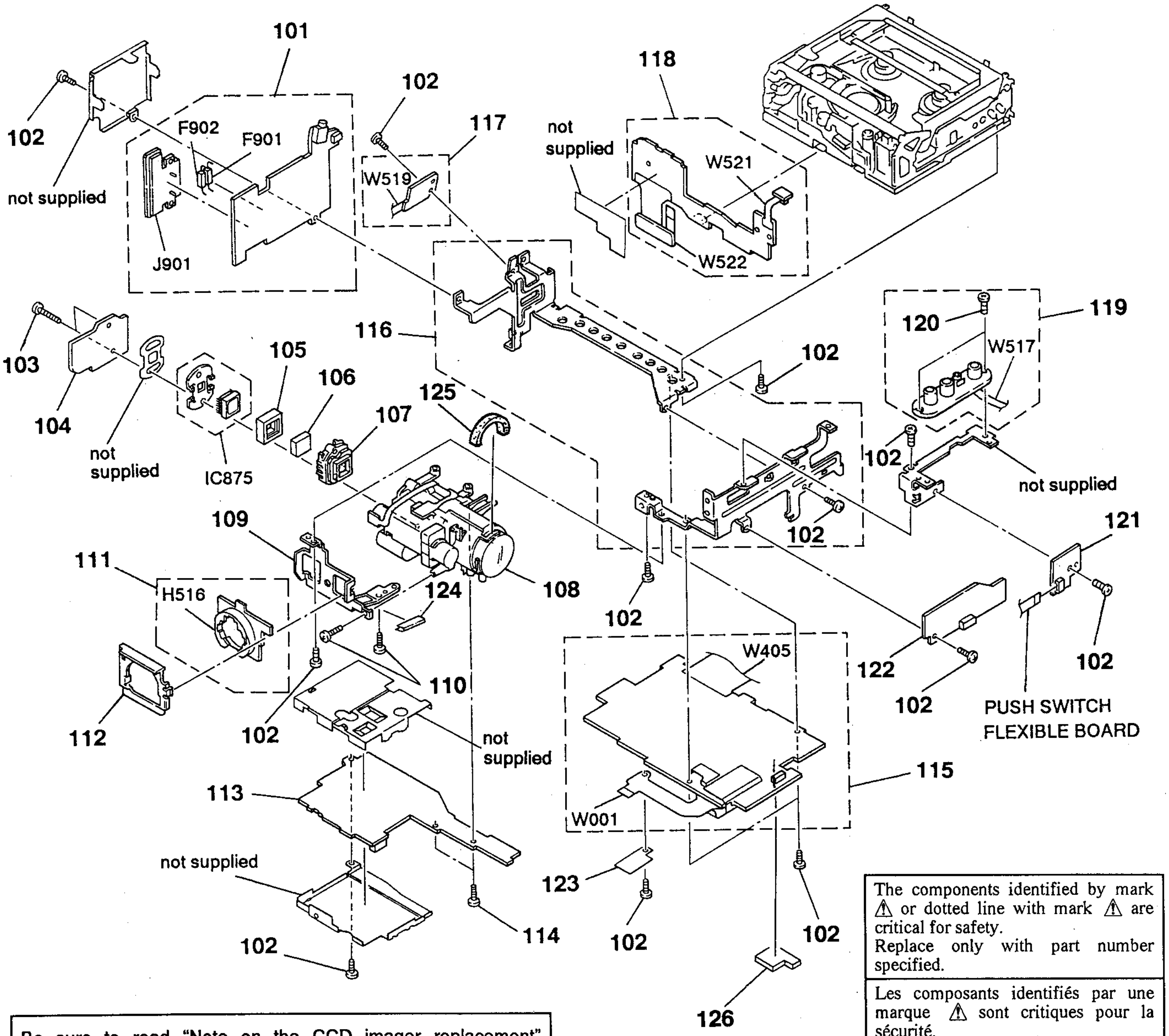
5-1. CABINET (L) AND FRONT PANEL ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3942-859-1	CABINET (L) ASSY (TR65)	
1	X-3942-969-1	CABINET (L) ASSY (TR353)	
2	3-736-807-01	BELT, GRIP	
3	3-578-221-00	SPRING, COMPRESSION	
4	3-942-985-01	KNOB, STAND-BY	
5	3-736-364-01	SPRING	
6	4-602-490-00	SPRING, TENSION	
7	3-942-895-01	STOPPER, BELT	
* 8	3-704-367-01	LABEL (TR65)	
* 9	3-955-734-01	LABEL, MODEL NUMBER (U/C)(TR65)	
* 9	3-955-735-01	LABEL, MODEL NUMBER (E)(TR353)	
10	3-719-381-01	SCREW (M2X4)	
11	X-3943-375-1	LID ASSY, CASSETTE (TR65)	
11	X-3943-377-1	LID ASSY, CASSETTE (TR353)	
12	X-3942-991-1	SHUTTER ASSY, WIDE	

Ref. No.	Part No.	Description	Rema
13	3-719-601-01	SCREW (B2X5), TAPPING	
14	1-696-487-11	CABLE, FLAT (FFC-90)	
* 15	A-7063-582-A	MA-170 BOARD, COMPLETE	
* 16	3-953-646-01	URETHANE (MIC)	
* 17	3-953-645-01	CUSHION (MIC)	
18	A-7091-800-A	MICROPHONE UNIT	
19	3-953-652-01	COVER, JACK	
20	X-3942-857-1	PANEL ASSY, FRONT	
21	3-945-269-01	KNOB, S	
22	3-953-655-01	KNOB (LENS)	
23	3-947-357-01	SPRING, TORSION	
24	1-467-367-22	REMOTE COMMANDER (RMT-704)	
25	3-708-412-01	LID, REMOTE COMMANDER	
26	3-947-664-11	HOLDER (B), REMOTE CONTROL	

5-3. MAIN BOARDS ASSEMBLY


101
102
not supplied
F902
F901
J901
102
117
W519
not supplied
118
W521
W522
116
103
104
105
106
125
107
not supplied
IC875
102
119
120
W517
102
not supplied
102
109
111
H516
124
108
121
102
112
110
102
not supplied
W405
122
102
102
PUSH SWITCH FLEXIBLE BOARD
115
W001
113
not supplied
123
114
102
102
102
126

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Be sure to read "Note on the CCD imager replacement" CCD-TR61/TR323 on page 87 when changing the CCD imager.

Ref. No.	Part No.	Description	Remark
* 101	A-7063-580-A	DD-56 BOARD, COMPLETE	
102	3-713-786-51	SCREW (M2X3)	
103	3-947-268-01	SCREW (B TIGHT)(2), TAPPING	
* 104	A-7063-575-A	CD-106 BOARD, COMPLETE	
105	3-946-857-01	RUBBER (S), SEAL	
106	1-547-558-21	FILTER BLOCK, OPTICAL	
107	3-946-856-01	ADAPTOR (H), CCD FITTING	
108	1-547-548-11	LENS, ZOOM (VCL-6210WC)	
108	1-547-630-11	LENS, ZOOM (VCL-6210WF)	
* 109	3-949-001-01	FRAME, LENS	
110	3-713-790-21	SCREW (M2X6), TAPPING, P3 (TR65)	
* 111	A-7071-829-A	LI-46 BOARD, COMPLETE	
112	3-948-842-01	HOLDER, LI	
* 113	A-7063-577-A	VC-133 BOARD, COMPLETE	
114	3-719-601-01	SCREW (B2X5), TAPPING	
* 115	A-7063-786-A	VS-100 BOARD, COMPLETE	
* 116	X-3942-209-1	FRAME (UPPER LOWER) ASSY	
* 117	A-7071-828-A	SW-223 BOARD, COMPLETE	
* 118	A-7063-578-A	SL-33 BOARD, COMPLETE	
* 119	A-7063-581-A	JK-99 BOARD, COMPLETE	
120	3-719-381-01	SCREW (M2X4)	
* 121	A-7071-830-A	WS-11 BOARD, COMPLETE	
* 122	A-7063-579-A	AU-150 BOARD, COMPLETE	
123	3-951-136-02	SHIELD, DRUM	
124	3-846-312-01	SPACER	
125	3-954-580-01	CUSHION, LENS	
* 126	3-954-411-01	SHEET (VS/LE), INSULATING	
⚠F901	1-532-778-21	FUSE, MICRO (SECONDARY)	
⚠F902	1-532-778-21	FUSE, MICRO (SECONDARY)	
H516	1-550-104-32	HOLDER, BATTERY	
IC875	A-7030-368-A	CCD BLOCK ASSY (054 SERVICE) (CCD IMAGER)	
J901	1-537-281-41	TERMINAL BOARD	
W001	1-696-489-11	FP-588 FLEXIBLE BOARD	
W405	1-644-285-11	FP-572 FLEXIBLE BOARD	
W517	1-751-165-11	CABLE, FLAT (FFC-100)	
W519	1-696-488-11	CABLE, FLAT (FFC-92)	
W521	1-642-186-11	FP-437 FLEXIBLE BOARD	
W522	1-696-490-11	FP-589 FLEXIBLE BOARD	

SECTION 6
ELECTRICAL PARTS LIST

FF-75 **VF-68**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description			Remark
*	A-7071-913-A	FF-75 BOARD, COMPLETE			
		**********************			
		(Ref. No. 3,000 Series)			
		< CONNECTOR >			
CN954	1-580-248-31	CONNECTOR, BOARD TO BOARD 20P			
**					
*	A-7063-779-A	VF-68 BOARD, COMPLETE			
		**********************			
		(Ref. No. 2,000 Series)			
	3-942-888-01	HOLDER, LED			
		< CAPACITOR >			
C804	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C805	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C806	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C807	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C808	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C809	1-164-346-11	CERAMIC CHIP	1uF		16V
C810	1-164-346-11	CERAMIC CHIP	1uF		16V
C811	1-164-346-11	CERAMIC CHIP	1uF		16V
C812	1-135-179-21	TANTAL. CHIP	2.2uF	20%	16V
C813	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C814	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C815	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C816	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C817	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C818	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C819	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C820	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C821	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C822	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C823	1-164-346-11	CERAMIC CHIP	1uF		16V
C824	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C825	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C828	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C829	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C830	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C832	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C833	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C834	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C835	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C838	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C839	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C840	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C842	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C844	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C845	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C846	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C847	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C848	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C849	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C850	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C851	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C852	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C853	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C861	1-164-346-11	CERAMIC CHIP	1uF		16V
C862	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C863	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C864	1-135-179-21	TANTAL. CHIP	2.2uF	20%	16V
C865	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C866	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C867	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C872	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C873	1-164-005-11	CERAMIC CHIP	0.47uF		25V
		< CONNECTOR >			
CN801	1-573-990-21	CONNECTOR, BOARD TO BOARD 10P			
* CN802	1-573-356-11	CONNECTOR, FFC/FPC 16P			
* CN803	1-573-351-11	CONNECTOR, FFC/FPC 11P			
		< DIODE >			
D801	8-719-025-91	DIODE MA365(E)			
D802	8-719-984-02	LED BR4371F			
		< IC >			
IC801	8-752-058-96	IC CXA1585Q			
IC802	8-752-058-95	IC CXA1515Q			
IC803	8-752-362-78	IC CXD2403R			
		< COIL >			
L801	1-414-078-11	INDUCTOR 10uH			
L803	1-414-078-11	INDUCTOR 10uH			
L805	1-412-962-11	INDUCTOR 82uH			
L806	1-412-962-11	INDUCTOR 82uH			

Ref. No.	Part No.	Description	Remark
L807	1-412-962-11	INDUCTOR 82uH	
L808	1-412-950-11	INDUCTOR 8.2uH	
L809	1-412-962-11	INDUCTOR 82uH	
L810	1-410-192-51	INDUCTOR 1uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q801	8-729-427-74	TRANSISTOR XP4601	
Q802	8-729-425-64	TRANSISTOR 2SD2216Q	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R801	1-218-958-11	METAL GLAZE 2.7K 5% 1/16W	
R802	1-218-965-11	METAL GLAZE 10K 5% 1/16W	
R803	1-218-955-11	METAL GLAZE 1.5K 5% 1/16W	
R805	1-218-965-11	METAL GLAZE 10K 5% 1/16W	
R806	1-218-965-11	METAL GLAZE 10K 5% 1/16W	
R807	1-218-970-11	METAL GLAZE 27K 5% 1/16W	
R808	1-218-965-11	METAL GLAZE 10K 5% 1/16W	
R809	1-218-953-11	METAL GLAZE 1K 5% 1/16W	
R810	1-218-953-11	METAL GLAZE 1K 5% 1/16W	
R811	1-218-953-11	METAL GLAZE 1K 5% 1/16W	
R812	1-218-966-11	METAL GLAZE 12K 5% 1/16W	
R813	1-218-973-11	METAL GLAZE 47K 5% 1/16W	
R814	1-218-989-11	METAL GLAZE 1M 5% 1/16W	
R815	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R816	1-218-971-11	METAL GLAZE 33K 5% 1/16W	
R817	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R818	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R819	1-218-980-11	METAL GLAZE 180K 5% 1/16W	
R820	1-218-970-11	METAL GLAZE 27K 5% 1/16W	
R821	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R822	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R823	1-218-971-11	METAL GLAZE 33K 5% 1/16W	
R824	1-218-990-11	METAL GLAZE 0 5% 1/16W	
R825	1-218-989-11	METAL GLAZE 1M 5% 1/16W	
R826	1-218-966-11	METAL GLAZE 12K 5% 1/16W	
R827	1-218-971-11	METAL GLAZE 33K 5% 1/16W	
R828	1-218-984-11	METAL GLAZE 390K 5% 1/16W	
R829	1-218-984-11	METAL GLAZE 390K 5% 1/16W	
R830	1-218-984-11	METAL GLAZE 390K 5% 1/16W	
R831	1-218-944-11	METAL GLAZE 180 5% 1/16W	
R833	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R834	1-218-971-11	METAL GLAZE 33K 5% 1/16W	
R835	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R836	1-218-976-11	METAL GLAZE 82K 5% 1/16W	
R837	1-218-990-11	METAL GLAZE 0 5% 1/16W	
R838	1-218-973-11	METAL GLAZE 47K 5% 1/16W	
R839	1-218-990-11	METAL GLAZE 0 5% 1/16W	
R840	1-218-973-11	METAL GLAZE 47K 5% 1/16W	
R841	1-218-965-11	METAL GLAZE 10K 5% 1/16W	
R842	1-218-953-11	METAL GLAZE 1K 5% 1/16W	
R843	1-218-971-11	METAL GLAZE 33K 5% 1/16W	
R849	1-218-965-11	METAL GLAZE 10K 5% 1/16W	
R856	1-218-990-11	METAL GLAZE 0 5% 1/16W	
R861	1-218-875-11	METAL CHIP 15K 0.50% 1/16W	
R862	1-218-905-11	METAL CHIP 270K 0.50% 1/16W	
R863	1-218-969-11	METAL GLAZE 22K 5% 1/16W	
R864	1-218-981-11	METAL GLAZE 220K 5% 1/16W	
R865	1-218-953-11	METAL GLAZE 1K 5% 1/16W	
R866	1-218-952-11	METAL GLAZE 820 5% 1/16W	
R867	1-218-967-11	METAL GLAZE 15K 5% 1/16W	
R868	1-218-966-11	METAL GLAZE 12K 5% 1/16W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV802	1-241-480-11	RES, ADJ, CERMET 47K	
RV803	1-241-480-11	RES, ADJ, CERMET 47K	
RV804	1-241-480-11	RES, ADJ, CERMET 47K	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X801	1-579-466-11	VIBRATOR, CRYSTAL (3.58MHz)	

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* A-7063-780-A VF-69 BOARD, COMPLETE
****
(Ref. No. 2,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C951	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C954	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C955	1-164-676-11	CERAMIC CHIP 2200PF 5% 16V	
C957	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C958	1-135-215-21	TANTAL. CHIP 6.8uF 20% 16V	
C959	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C960	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C961	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C963	1-104-913-11	TANTAL. CHIP 10uF 20% 16V	
C964	1-164-836-11	CERAMIC CHIP 6.8uF 16V	
C966	1-165-128-11	CERAMIC CHIP 0.22uF 16V	
C969	1-163-018-00	CERAMIC CHIP 0.0056uF 5% 50V	
C970	1-163-018-00	CERAMIC CHIP 0.0056uF 5% 50V	
C971	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C972	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C973	1-162-921-11	CERAMIC CHIP 33PF 5% 50V	
C974	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C975	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C976	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C977	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C978	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C979	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C980	1-164-505-11	CERAMIC CHIP 2.2uF 16V	

Ref. No.	Part No.	Description			Remark
C981	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
		< CONNECTOR >			
CN951	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
* CN953	1-573-351-11	CONNECTOR, FFC/FPC 11P			
* CN955	1-580-267-11	CONNECTOR, BOARD TO BOARD 20P			
		< DIODE >			
D951	8-719-043-70	DIODE	MA6S121-(TX)		
D952	8-719-404-19	DIODE	LN1251C		
D954	8-719-802-36	DIODE	1SS250		
D955	8-719-820-41	DIODE	1SS302		
D956	8-719-027-45	DIODE	MA740		
D957	8-719-027-45	DIODE	MA740		
D958	8-719-420-14	DIODE	MA8082-M		
D959	8-719-420-14	DIODE	MA8082-M		
D960	8-719-420-14	DIODE	MA8082-M		
		< IC >			
IC951	8-759-097-75	IC	MB3789PFV-G-BND		
IC952	8-759-070-51	IC	SN74HCU04ADB		
IC954	8-759-998-98	IC	LM358D		
		< COIL >			
L951	1-414-080-11	INDUCTOR 22uH			
L952	1-412-029-11	INDUCTOR CHIP 10uH			
L953	1-412-030-11	INDUCTOR CHIP 22uH			
		< TRANSISTOR >			
Q951	8-729-929-24	TRANSISTOR	DTC143TE-TL		
Q953	8-729-015-64	TRANSISTOR	MTD9N10E		
Q954	8-729-928-55	TRANSISTOR	DTA123JE		
		< RESISTOR >			
R951	1-218-971-11	METAL GLAZE	33K	5%	1/16W
R953	1-218-981-11	METAL GLAZE	220K	5%	1/16W
R954	1-218-975-11	METAL GLAZE	68K	5%	1/16W
R957	1-218-973-11	METAL GLAZE	47K	5%	1/16W
R958	1-218-965-11	METAL GLAZE	10K	5%	1/16W
R959	1-218-744-11	METAL CHIP	150K	0.50%	1/16W
R960	1-216-848-11	METAL CHIP	180K	5%	1/16W
R961	1-218-982-11	METAL GLAZE	270K	5%	1/16W
R962	1-218-973-11	METAL GLAZE	47K	5%	1/16W
R963	1-218-970-11	METAL GLAZE	27K	5%	1/16W
R965	1-218-975-11	METAL GLAZE	68K	5%	1/16W
R966	1-218-973-11	METAL GLAZE	47K	5%	1/16W
R967	1-218-903-11	METAL CHIP	220K	0.50%	1/16W
R968	1-218-744-11	METAL CHIP	150K	0.50%	1/16W
R970	1-218-980-11	METAL GLAZE	180K	5%	1/16W
R971	1-218-970-11	METAL GLAZE	27K	5%	1/16W
R973	1-216-833-11	METAL CHIP	10K	5%	1/16W
R974	1-216-849-11	METAL CHIP	220K	5%	1/16W
R975	1-216-846-11	METAL CHIP	120K	5%	1/16W
R978	1-218-969-11	METAL GLAZE	22K	5%	1/16W
R979	1-218-961-11	METAL GLAZE	4.7K	5%	1/16W
R980	1-218-936-11	METAL GLAZE	39	5%	1/16W
R981	1-218-962-11	METAL GLAZE	5.6K	5%	1/16W
R982	1-218-966-11	METAL GLAZE	12K	5%	1/16W
R983	1-218-972-11	METAL GLAZE	39K	5%	1/16W
R984	1-218-960-11	METAL GLAZE	3.9K	5%	1/16W
R985	1-218-965-11	METAL GLAZE	10K	5%	1/16W
R986	1-218-962-11	METAL GLAZE	5.6K	5%	1/16W
R991	1-216-296-00	METAL CHIP	0	5%	1/8W
R997	1-218-973-11	METAL GLAZE	47K	5%	1/16W
R998	1-218-977-11	METAL GLAZE	100K	5%	1/16W
		< VARIABLE RESISTOR >			
RV951	1-241-480-11	RES, ADJ, CERMET 47K			
RV953	1-230-523-11	RES, ADJ, METAL 10K (BRIGHTNESS)			
RV954	1-230-523-11	RES, ADJ, METAL 10K (COLOR)			
RV955	1-230-523-11	RES, ADJ, METAL 10K (HUE)			
		< TRANSFORMER >			
T951	1-450-900-11	TRANSFORMER, INVERTER			

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* A-7063-786-A VS-100 BOARD, COMPLETE

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(Ref. No. 4,000 Series)

< CAPACITOR >

C001	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C002	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C003	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C004	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C005	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C006	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C009	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C010	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C011	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C012	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C013	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C014	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C018	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C019	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C020	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C021	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C022	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C023	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C024	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C025	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C026	1-164-360-11	CERAMIC CHIP	0. 1uF		16V
C027	1-164-360-11	CERAMIC CHIP	0. 1uF		16V
C028	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C029	1-164-360-11	CERAMIC CHIP	0. 1uF		16V
C030	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C035	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C049	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C057	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C058	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C059	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C061	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C063	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C064	1-162-995-11	CERAMIC CHIP	0. 022uF		50V
C065	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C066	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C067	1-165-128-11	CERAMIC CHIP	0. 22uF		16V
C068	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C069	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C072	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C073	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C074	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C075	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C076	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C077	1-164-227-11	CERAMIC CHIP	0. 022uF	10%	25V
C080	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C081	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C082	1-164-227-11	CERAMIC CHIP	0. 022uF	10%	25V
C083	1-164-227-11	CERAMIC CHIP	0. 022uF	10%	25V
C085	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C091	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C092	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C150	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C151	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C156	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C159	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C161	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C167	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C168	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C170	1-162-568-11	CERAMIC CHIP	0. 33uF		25V
C171	1-162-638-11	CERAMIC CHIP	1uF		16V
C173	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C175	1-128-004-11	ELECT CHIP	10uF	20%	16V
C176	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C177	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C178	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C179	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C180	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C181	1-162-965-11	CERAMIC CHIP	0. 0015uF	10%	50V
C182	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C187	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C192	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C194	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C199	1-135-149-21	TANTALUM CHIP	2. 2uF	20%	10V
C205	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C206	1-164-360-11	CERAMIC CHIP	0. 1uF		16V
C207	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C208	1-162-967-11	CERAMIC CHIP	0. 0033uF	10%	50V
C209	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C213	1-164-222-11	CERAMIC CHIP	0. 22uF		25V
C214	1-164-005-11	CERAMIC CHIP	0. 47uF		25V
C216	1-128-004-11	ELECT CHIP	10uF	20%	16V
C217	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V
C218	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C219	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C220	1-126-246-11	ELECT CHIP	220uF	20%	4V
C221	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C222	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C223	1-128-004-11	ELECT CHIP	10uF	20%	16V
C225	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C226	1-164-005-11	CERAMIC CHIP	0. 47uF		25V
C227	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C228	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C229	1-135-180-21	TANTALUM CHIP	3. 3uF	20%	6. 3V
C230	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C231	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C232	1-135-180-21	TANTALUM CHIP	3. 3uF	20%	6. 3V
C233	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V
C234	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C235	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C236	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C237	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C238	1-164-005-11	CERAMIC CHIP	0. 47uF		25V
C239	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C240	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C241	1-126-607-11	ELECT CHIP	47uF	20%	4V
C242	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C246	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C247	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V
C248	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C249	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C250	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C254	1-162-995-11	CERAMIC CHIP	0. 022uF		50V
C255	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C256	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C257	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C259	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C260	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C261	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C262	1-162-954-11	CERAMIC CHIP	120PF	5%	50V

Ref. No.	Part No.	Description			Remark
C263	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C264	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C265	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C266	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C267	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C268	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C271	1-128-004-11	ELECT CHIP	10uF	20%	16V
C272	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C273	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C274	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C275	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C278	1-162-638-11	CERAMIC CHIP	1uF		16V
C280	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C281	1-135-146-21	TANTALUM CHIP	0.68uF	20%	25V
C282	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C283	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C284	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C285	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C286	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C288	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C289	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C290	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C292	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C294	1-162-638-11	CERAMIC CHIP	1uF		16V
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C297	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C299	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C300	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C301	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C303	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C305	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C306	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C307	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C308	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C401	1-164-346-11	CERAMIC CHIP	1uF		16V
C402	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C404	1-164-346-11	CERAMIC CHIP	1uF		16V
C406	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C407	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C408	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C409	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C412	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C413	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C414	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C415	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C416	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C417	1-164-360-11	CERAMIC CHIP	0.1uF		16V

Ref. No.	Part No.	Description			Remark
C418	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C420	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C421	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C422	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C423	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C424	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C425	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C426	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C427	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C428	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C429	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C430	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C431	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C432	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C433	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C434	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C435	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C437	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C438	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C439	1-162-907-11	CERAMIC CHIP	2PF	0.25PF	50V
C440	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C441	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C442	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C443	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C444	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C445	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C446	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C447	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C449	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C450	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C451	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C452	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C453	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C454	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C455	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C456	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C457	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C458	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C459	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C460	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C461	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C462	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C463	1-135-215-21	TANTAL. CHIP	6.8uF	20%	16V
C464	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C465	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C466	1-164-298-11	CERAMIC CHIP	0.15uF	10%	25V
C467	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C468	1-164-298-11	CERAMIC CHIP	0.15uF	10%	25V
C469	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V

Ref.No.	Part No.	Description			Remark
C470	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C471	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C472	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C473	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C474	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C475	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C476	1-135-179-21	TANTAL. CHIP	2.2uF	20%	16V
C477	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C478	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C481	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C482	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C483	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C484	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C485	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C486	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C487	1-128-530-11	ELECT CHIP	33uF	20%	10V
		< CERAMIC FILTER >			
CF151	1-579-370-11	FILTER, CERAMIC			
		< CONNECTOR >			
CN002	1-569-775-21	PIN, CONNECTOR 5P			
CN101	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P			
CN102	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
CN401	1-695-880-11	CONNECTOR, BOARD TO BOARD 32P			
CN403	1-573-338-11	CONNECTOR, BOARD TO BOARD 20P			
CN404	1-695-325-11	CONNECTOR, BOARD TO BOARD 42P			
CN406	1-573-343-21	CONNECTOR, BOARD TO BOARD 30P			
* CN407	1-580-055-21	PIN, CONNECTOR 2P			
		< DIODE >			
D001	8-719-800-76	DIODE	1SS226		
D152	8-719-027-48	DIODE	MA142WA		
D159	8-719-027-50	DIODE	MA142WK		
D160	8-719-027-50	DIODE	MA142WK		
D163	8-719-027-50	DIODE	MA142WK		
⚠D401	8-719-421-27	DIODE	MA728		
D402	8-719-027-50	DIODE	MA142WK		
D403	8-719-404-46	DIODE	MA110		
		< FILTER >			
FL152	1-236-575-11	B.P.F (PAL-M)			
FL153	1-236-146-11	FILTER, BAND PASS			
FL155	1-236-757-21	FILTER, LOW PASS (C)			
FL401	1-406-452-11	COIL, OSC			
		< IC >			
IC001	8-752-033-38	IC	CXA1202R		
IC003	8-752-053-21	IC	CXA1211M		
IC151	8-752-065-54	IC	CXA1207AR		

Ref.No.	Part No.	Description		Remark
IC152	8-752-051-40	IC	CXA1208R	
IC154	8-752-332-68	IC	CXL5502M	
IC155	8-752-053-21	IC	CXA1211M	
IC156	8-759-067-52	IC	MB88347PFV-G-BND-ER	
IC158	8-759-064-36	IC	MB88346BPFV	
IC159	8-759-636-33	IC	CXA1452	
⚠IC401	8-759-056-84	IC	S-8420AF	
IC402	8-752-836-29	IC	CXP80624-416R	
IC403	8-759-096-79	IC	uPD75316GF-318-3B9	
IC404	8-759-059-42	IC	CXA1481AR	
IC405	8-759-044-78	IC	AK6420F	
IC406	8-759-081-96	IC	uPD6456GS-620	
IC407	8-759-145-63	IC	uPD7564G-540	
IC408	8-759-057-60	IC	MCD004BM	
IC409	8-759-999-02	IC	TL1596CDB	
IC410	8-759-062-02	IC	MPC1720VM	
		< COIL >		
L001	1-410-381-11	INDUCTOR CHIP	10uH	
L002	1-412-066-21	INDUCTOR CHIP	220uH	
L003	1-412-066-21	INDUCTOR CHIP	220uH	
L005	1-412-060-11	INDUCTOR CHIP	22uH	
L007	1-412-058-11	INDUCTOR CHIP	10uH	
L009	1-410-380-31	INDUCTOR CHIP	8.2uH	
L010	1-410-655-31	INDUCTOR CHIP	120uH	
L011	1-412-280-31	INDUCTOR	330uH	
L012	1-410-387-11	INDUCTOR CHIP	33uH	
L013	1-410-657-21	INDUCTOR CHIP	180uH	
L015	1-410-381-11	INDUCTOR CHIP	10uH	
L150	1-410-389-31	INDUCTOR CHIP	47uH	
L152	1-410-385-41	INDUCTOR CHIP	22uH	
L154	1-410-390-11	INDUCTOR CHIP	56uH	
L155	1-410-390-11	INDUCTOR CHIP	56uH	
L160	1-412-058-11	INDUCTOR CHIP	10uH	
L161	1-410-385-41	INDUCTOR CHIP	22uH	
L162	1-412-280-31	INDUCTOR	330uH	
L163	1-410-167-41	INDUCTOR CHIP	820uH	
L164	1-410-657-21	INDUCTOR CHIP	180uH	
L169	1-410-389-31	INDUCTOR CHIP	47uH	
L171	1-410-390-11	INDUCTOR CHIP	56uH	
L175	1-410-393-11	INDUCTOR CHIP	100uH	
L176	1-410-656-11	INDUCTOR CHIP	150uH	
L177	1-412-058-11	INDUCTOR CHIP	10uH	
L178	1-412-062-11	INDUCTOR CHIP	47uH	
L179	1-410-379-31	INDUCTOR CHIP	6.8uH	
L180	1-410-393-11	INDUCTOR CHIP	100uH	
L181	1-410-393-11	INDUCTOR CHIP	100uH	
L182	1-410-655-31	INDUCTOR CHIP	120uH	
L183	1-410-385-41	INDUCTOR CHIP	22uH	
L185	1-412-058-11	INDUCTOR CHIP	10uH	

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Ref. No.	Part No.	Description	Remark
L186	1-412-052-21	INDUCTOR CHIP 1uH	
L401	1-412-056-11	INDUCTOR CHIP 4.7uH	
L402	1-412-058-11	INDUCTOR CHIP 10uH	
L403	1-412-062-11	INDUCTOR CHIP 47uH	
L404	1-412-058-11	INDUCTOR CHIP 10uH	
L405	1-412-058-11	INDUCTOR CHIP 10uH	
L406	1-412-058-11	INDUCTOR CHIP 10uH	
L407	1-412-052-21	INDUCTOR CHIP 1uH	

< IC LINK >

Ref. No.	Part No.	Description	Remark
⚠PS401	1-576-122-21	LINK, IC (CCP2E10 0.4A)	
⚠PS402	1-576-123-21	LINK, IC (CCP2E20 0.8A)	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q001	8-729-216-22	TRANSISTOR 2SA1162-G	
Q002	8-729-014-16	TRANSISTOR RN2302-TE85L	
Q003	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q008	8-729-117-32	TRANSISTOR 2SC4177	
Q010	8-729-403-35	TRANSISTOR UN5113	
Q019	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q020	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q021	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q024	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q025	8-729-014-16	TRANSISTOR RN2302-TE85L	
Q026	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q029	8-729-403-35	TRANSISTOR UN5113	
Q151	8-729-101-07	TRANSISTOR 2SB798-DL	
Q152	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q154	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q158	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q161	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q162	8-729-403-35	TRANSISTOR UN5113	
Q166	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q168	8-729-403-35	TRANSISTOR UN5113	
Q170	8-729-420-20	TRANSISTOR XN4312	
Q171	8-729-117-73	TRANSISTOR 2SC4178-F14	
Q172	8-729-117-73	TRANSISTOR 2SC4178-F14	
Q174	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q175	8-729-117-32	TRANSISTOR 2SC4177	
Q176	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q177	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q178	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q180	8-729-422-54	TRANSISTOR XN4215	
Q182	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q183	8-729-420-53	TRANSISTOR UN5115	
Q184	8-729-117-32	TRANSISTOR 2SC4177	
Q189	8-729-117-32	TRANSISTOR 2SC4177	
Q192	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q194	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q195	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q196	8-729-403-35	TRANSISTOR UN5113	
Q199	8-729-807-87	TRANSISTOR 2SB1295-UL6	
Q200	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q203	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q204	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q205	8-729-402-42	TRANSISTOR UN5213	
Q207	8-729-403-35	TRANSISTOR UN5113	
Q208	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q210	8-729-402-42	TRANSISTOR UN5213	
Q221	8-729-420-12	TRANSISTOR XN4213	
Q231	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q232	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q233	8-729-117-32	TRANSISTOR 2SC4177	
Q233	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q234	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q236	8-729-420-56	TRANSISTOR UN511E	
Q237	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q401	8-729-402-48	TRANSISTOR UN521E	
Q402	8-729-905-23	TRANSISTOR 2SA1576-R	
Q403	8-729-403-35	TRANSISTOR UN5113	
Q405	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q409	8-729-017-67	TRANSISTOR 2SB1574	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R001	1-216-806-11	METAL GLAZE 56 5% 1/16W	
R002	1-216-818-11	METAL CHIP 560 5% 1/16W	
R003	1-216-803-11	METAL CHIP 33 5% 1/16W	
R004	1-216-814-11	METAL CHIP 270 5% 1/16W	
R005	1-216-813-11	METAL CHIP 220 5% 1/16W	
R006	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R007	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R012	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R013	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R016	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R017	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R020	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R021	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R022	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R023	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R024	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R025	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R026	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R027	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R028	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R030	1-216-864-11	METAL CHIP 0 5% 1/16W	
R031	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R033	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R049	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R050	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R051	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	

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Ref. No.	Part No.	Description				Remark
R052	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R054	1-216-817-11	METAL CHIP	470	5%	1/16W	
R055	1-216-820-11	METAL CHIP	820	5%	1/16W	
R056	1-216-864-11	METAL CHIP	0	5%	1/16W	
R057	1-216-818-11	METAL CHIP	560	5%	1/16W	
R058	1-216-818-11	METAL CHIP	560	5%	1/16W	
R060	1-216-864-11	METAL CHIP	0	5%	1/16W	
R061	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R062	1-216-818-11	METAL CHIP	560	5%	1/16W	
R063	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R064	1-216-817-11	METAL CHIP	470	5%	1/16W	
R066	1-216-809-11	METAL CHIP	100	5%	1/16W	
R067	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R070	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R071	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R072	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R076	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R078	1-216-820-11	METAL CHIP	820	5%	1/16W	
R079	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R081	1-216-864-11	METAL CHIP	0	5%	1/16W	
R082	1-216-864-11	METAL CHIP	0	5%	1/16W	
R083	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R085	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R086	1-216-817-11	METAL CHIP	470	5%	1/16W	
R087	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R088	1-216-808-11	METAL CHIP	82	5%	1/16W	
R090	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R097	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R112	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R113	1-216-295-00	METAL CHIP	0	5%	1/10W	
R114	1-216-864-11	METAL CHIP	0	5%	1/16W	
R131	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R132	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R142	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R151	1-216-296-00	METAL CHIP	0	5%	1/8W	
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R153	1-216-304-11	METAL CHIP	3.3	5%	1/10W	
R154	1-216-820-11	METAL CHIP	820	5%	1/16W	
R155	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R156	1-216-296-00	METAL CHIP	0	5%	1/8W	
R158	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R160	1-216-819-11	METAL CHIP	680	5%	1/16W	
R161	1-216-809-11	METAL CHIP	100	5%	1/16W	
R164	1-216-809-11	METAL CHIP	100	5%	1/16W	
R167	1-216-820-11	METAL CHIP	820	5%	1/16W	
R168	1-216-820-11	METAL CHIP	820	5%	1/16W	
R170	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R175	1-216-813-11	METAL CHIP	220	5%	1/16W	
R177	1-216-818-11	METAL CHIP	560	5%	1/16W	
R178	1-216-817-11	METAL CHIP	470	5%	1/16W	
R179	1-216-820-11	METAL CHIP	820	5%	1/16W	
R189	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R190	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R192	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R193	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R194	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R195	1-216-819-11	METAL CHIP	680	5%	1/16W	
R196	1-216-815-11	METAL CHIP	330	5%	1/16W	
R198	1-216-817-11	METAL CHIP	470	5%	1/16W	
R199	1-216-816-11	METAL CHIP	390	5%	1/16W	
R200	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R201	1-216-815-11	METAL CHIP	330	5%	1/16W	
R202	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R204	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R205	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R206	1-216-813-11	METAL CHIP	220	5%	1/16W	
R208	1-216-864-11	METAL CHIP	0	5%	1/16W	
R211	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R213	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R216	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R217	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R218	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R219	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R220	1-216-811-11	METAL CHIP	150	5%	1/16W	
R221	1-216-864-11	METAL CHIP	0	5%	1/16W	
R222	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R223	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R224	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R226	1-216-818-11	METAL CHIP	560	5%	1/16W	
R228	1-216-812-11	METAL CHIP	180	5%	1/16W	
R230	1-216-807-11	METAL CHIP	68	5%	1/16W	
R231	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R232	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R242	1-216-818-11	METAL CHIP	560	5%	1/16W	
R243	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R253	1-216-820-11	METAL CHIP	820	5%	1/16W	
R254	1-216-820-11	METAL CHIP	820	5%	1/16W	
R255	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R256	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R257	1-216-809-11	METAL CHIP	100	5%	1/16W	
R258	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R259	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R260	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R263	1-216-864-11	METAL CHIP	0	5%	1/16W	
R266	1-216-864-11	METAL CHIP	0	5%	1/16W	
R267	1-216-864-11	METAL CHIP	0	5%	1/16W	
R270	1-216-864-11	METAL CHIP	0	5%	1/16W	
R271	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R276	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R277	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R278	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R279	1-216-818-11	METAL CHIP	560	5%	1/16W	
R280	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R281	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R282	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R283	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R285	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R286	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R290	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R291	1-216-820-11	METAL CHIP	820	5%	1/16W	
R293	1-216-807-11	METAL CHIP	68	5%	1/16W	
R294	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R295	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R297	1-216-820-11	METAL CHIP	820	5%	1/16W	
R298	1-216-820-11	METAL CHIP	820	5%	1/16W	
R299	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R300	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R301	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R304	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R306	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R307	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R309	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R310	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R312	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R314	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R315	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R316	1-216-817-11	METAL CHIP	470	5%	1/16W	
R320	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R321	1-216-819-11	METAL CHIP	680	5%	1/16W	
R324	1-216-817-11	METAL CHIP	470	5%	1/16W	
R329	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R333	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R334	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R335	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R338	1-216-864-11	METAL CHIP	0	5%	1/16W	
R339	1-216-864-11	METAL CHIP	0	5%	1/16W	
R346	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R347	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R352	1-216-864-11	METAL CHIP	0	5%	1/16W	
R353	1-216-864-11	METAL CHIP	0	5%	1/16W	
R357	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R358	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R359	1-216-296-00	METAL CHIP	0	5%	1/8W	
R360	1-216-296-00	METAL CHIP	0	5%	1/8W	
R362	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R363	1-216-864-11	METAL CHIP	0	5%	1/16W	
R366	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R369	1-216-864-11	METAL CHIP	0	5%	1/16W	
R370	1-216-864-11	METAL CHIP	0	5%	1/16W	
R371	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R376	1-216-817-11	METAL CHIP	470	5%	1/16W	
R377	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R378	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R379	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R381	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R386	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R387	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R388	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R389	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R390	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R391	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R392	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R393	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R394	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R395	1-216-864-11	METAL CHIP	0	5%	1/16W	
R396	1-216-864-11	METAL CHIP	0	5%	1/16W	
R397	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R398	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R401	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R403	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R404	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R405	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R406	1-216-809-11	METAL CHIP	100	5%	1/16W	
R407	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R408	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R409	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R410	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R411	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R412	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R413	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R414	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R415	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R416	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R417	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R418	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R419	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R420	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R421	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R422	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R423	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R424	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R425	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R426	1-216-852-11	METAL CHIP	390K	5%	1/16W	
R427	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R428	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R429	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R430	1-216-851-11	METAL CHIP	330K	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R431	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R432	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R433	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R435	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R436	1-216-864-11	METAL CHIP 0 5% 1/16W	
R437	1-216-817-11	METAL CHIP 470 5% 1/16W	
R438	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R439	1-216-864-11	METAL CHIP 0 5% 1/16W	
R441	1-216-864-11	METAL CHIP 0 5% 1/16W	
R442	1-216-864-11	METAL CHIP 0 5% 1/16W	
R443	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R445	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R447	1-216-864-11	METAL CHIP 0 5% 1/16W	
R448	1-216-809-11	METAL CHIP 100 5% 1/16W	
R449	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R450	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R451	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R452	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R453	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R454	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R456	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R457	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R460	1-216-864-11	METAL CHIP 0 5% 1/16W	
R461	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R462	1-216-809-11	METAL CHIP 100 5% 1/16W	
R463	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R468	1-216-039-00	METAL CHIP 390 5% 1/10W	
R469	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R470	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R471	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R472	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R473	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R474	1-217-671-11	METAL CHIP 1 5% 1/10W	
R475	1-217-671-11	METAL CHIP 1 5% 1/10W	
R476	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R479	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R480	1-217-671-11	METAL CHIP 1 5% 1/10W	
R481	1-217-671-11	METAL CHIP 1 5% 1/10W	
R484	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R485	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R487	1-216-864-11	METAL CHIP 0 5% 1/16W	
R488	1-216-809-11	METAL CHIP 100 5% 1/16W	
R489	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R490	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R491	1-216-296-00	METAL CHIP 0 5% 1/8W	
R492	1-216-864-11	METAL CHIP 0 5% 1/16W	
R493	1-216-864-11	METAL CHIP 0 5% 1/16W	
R497	1-216-864-11	METAL CHIP 0 5% 1/16W	
R498	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	

< COMPOSITION CIRCUIT BLOCK >

Ref. No.	Part No.	Description	Remark
RB401	1-236-442-11	NETWORK, RES 330K	
RB402	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE)	
RB403	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE)	
RB404	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)	
RB405	1-236-436-11	NETWORK, RES 100K	
RB406	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)	
RB407	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE)	
RB408	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)	
RB409	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)	
RB410	1-236-412-11	NETWORK, RES 1.0K	
RB411	1-236-424-11	NETWORK, RES 10K	
RB414	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)	
RB416	1-236-412-11	NETWORK, RES 1.0K	
RB417	1-236-444-11	NETWORK, RES 470K	
RB418	1-236-408-11	NETWORK, RES 470	
RB419	1-236-412-11	NETWORK, RES 1.0K	
RB420	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)	
RB421	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)	
RB422	1-236-424-11	NETWORK, RES 10K	
RB423	1-236-424-11	NETWORK, RES 10K	
RB424	1-236-424-11	NETWORK, RES 10K	
RB425	1-236-424-11	NETWORK, RES 10K	
RB426	1-236-412-11	NETWORK, RES 1.0K	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV151	1-238-087-11	RES, ADJ, CERMET 1K	

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description	Remark
W001	1-696-489-11	FP-588 FLEXIBLE BOARD	
W405	1-644-285-11	FP-572 FLEXIBLE BOARD	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X151	1-579-365-21	VIBRATOR, CRYSTAL (3.58MHz)	
X401	1-579-063-21	VIBRATOR, CERAMIC (4.19MHz)	
X402	1-579-049-21	VIBRATOR, CRYSTAL (32.768kHz)	
X403	1-579-367-21	VIBRATOR, CRYSTAL (11.89MHz)	
X404	1-579-551-11	VIBRATOR, CERAMIC (700kHz)	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
14	1-696-487-11	CABLE, FLAT (FFC-90)	
18	A-7091-800-A	MICROPHONE UNIT	
80	1-692-257-31	SWITCH, PUSH (ZOOM)	
106	1-547-558-21	FILTER BLOCK, OPTICAL	
108	1-547-548-11	LENS, ZOOM (VCL-6210WC)	
264	1-568-323-11	CONNECTOR (4P)	
322	1-641-643-12	FP-444 FLEXIBLE BOARD	

Ref. No.	Part No.	Description	Remark
324	1-691-254-13	CONNECTOR, TRANSLATION 10P	
BL951	1-519-746-22	TUBE, FLUORESCENT (0.7INCH)	
⚠F901	1-532-778-21	FUSE, MICRO (SECONDARY)	
⚠F902	1-532-778-21	FUSE, MICRO (SECONDARY)	
H516	1-550-104-32	HOLDER, BATTERY	
IC875	A-7030-368-A	CCD BLOCK ASSY (054 SERVICE)(CCD IMAGER)	
J901	1-537-281-41	TERMINAL BOARD	
LCD901	8-753-011-05	LCX003BK-2	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
M904	3-708-494-01	METER ASSY, IG (IRIS)	
M905	3-708-491-01	MOTOR ASSY, STEPPING (FOCUS)	
M906	3-708-492-01	MOTOR ASSY, PZ (ZOOM)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	
S005	1-570-771-21	SWITCH (C DOWN)	
W001	1-696-489-11	FP-588 FLEXIBLE BOARD	
W405	1-644-285-11	FP-572 FLEXIBLE BOARD	
W517	1-751-165-11	CABLE, FLAT (FFC-100)	
W519	1-696-488-11	CABLE, FLAT (FFC-92)	
W521	1-642-186-11	FP-437 FLEXIBLE BOARD	
W522	1-696-490-11	FP-589 FLEXIBLE BOARD	
W971	1-696-484-11	CABLE, FLAT (FFC-87)	
W986	1-696-621-11	FP-590 FLEXIBLE BOARD	
W987	1-696-622-11	FP-591 FLEXIBLE BOARD	
W991	1-696-483-11	CABLE, FLAT (FFC-86)	

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ACCESSORIES & PACKING MATERIALS

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	1-467-367-22	REMOTE COMMANDER (RMT-704)
	1-575-334-11	CORD, CONNECTION (A/V connecting cable, 1.5m)
	3-738-517-01	BELT (S), SHOULDER
	3-757-525-21	MANUAL, INSTRUCTION (ENGLISH)(TR65)
	3-757-525-31	MANUAL, INSTRUCTION (FRENCH) (TR65:Canadian)
	3-757-584-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (TR353)
	3-757-584-41	MANUAL, INSTRUCTION (CHINESE)(TR353)
*	3-795-581-21	SAFEGUARD (SONY), IMPORTANT (TR65:US)
	3-947-664-11	HOLDER (B), REMOTE CONTROL
*	3-955-678-01	INDIVIDUAL CARTON (TR65)
*	3-955-678-11	INDIVIDUAL CARTON (TR353)
*	3-955-679-01	CUSHION, ACC
*	3-955-680-01	CUSHION (LOWER)
	A-6768-253-A	RFU ADAPTOR (RFU-90UC)

Ref. No.	Part No.	Description	Remark
**	AC-V25/V25A	AC POWER ADAPTOR	
***	NP-55	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE

*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY

Be sure to read "Note on the CCD imager replacement" CCD-TR61/TR323 on page 87 when changing the CCD imager.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

SECTION 7
CAMERA SECTION ADJUSTMENTS

7-1. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENTS

Note 1: The backlight (fluorescent tube) is driven by a 800 Vp-p, 16 kHz AC power supply.
Therefore, be careful not to touch the backlight holder as you will receive an electric shock.

Note 2: When replacing the LCD unit, ensure there will be no damages by static electricity.

[Adjusting connector]

Most measuring points for adjusting the view-finder are concentrated at CN801 of the VF-68 board. Connect the measuring equipments via the measuring pin tool. The following table lists the pin numbers and signal names of CN801.

Pin No.	Signal Name	Pin No.	Signal Name
1	LC COM	2	EVF GND
3	G OUT	4	13.5V
5	SELFR	6	12V
7	R OUT	8	B OUT
9	BRIGHT	10	PCO

Table 7-1.

Measuring pin tool Parts Code: J-6082-192-A

[Positions of RVs during adjustments]

Unless specified otherwise, set RVs to the following positions and adjust.

RV953 (BRIGHT)········· Refer to "BRIGHT Adjustment"
RV954 (COLOR)·········· Mechanical center
RV955 (HUE)·············· 20 °± 10 ° from the mechanical center in the counterclockwise (○)

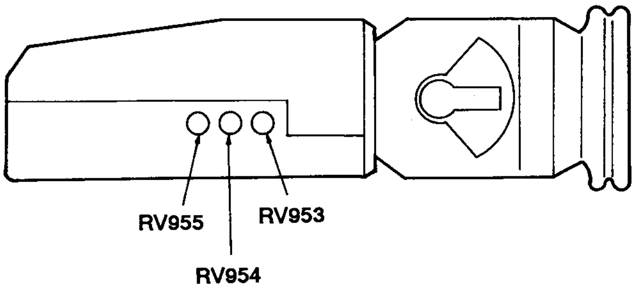


Fig. 7-1.

[Power Supply Voltage]

Adjust the power supply voltage for the battery pin so that Pin ① (EVF UNREG) of CN951 of the VF-69 board becomes 6.0 ± 0.1 Vdc.

[Connecting the Pattern Generator]

Connect the pattern generator as shown Fig. 7-2.

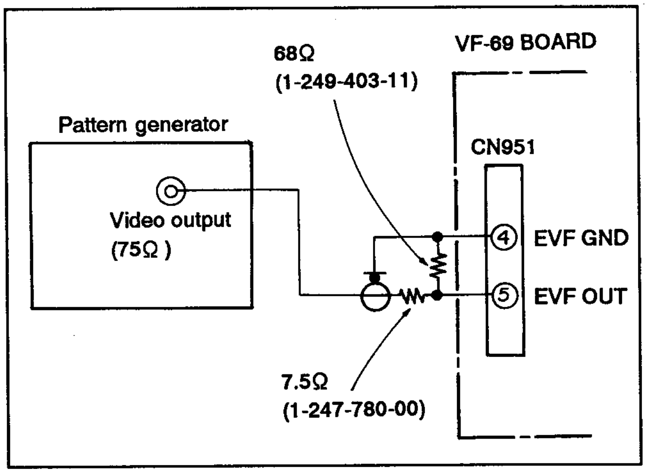


Fig. 7-2.

[Video Input Signal for Adjusting]

If the signal column specifies "Color bar signal whose chroma signal and burst signal are turned off", input a color bar signal whose chroma signal and burst signal have been turned off to the video input pin as the video input signal for adjusting. Check that the signal level of Pin ⑤ of CN951 of the VF-69 board is 0.9 ± 0.12 Vp-p before adjusting.

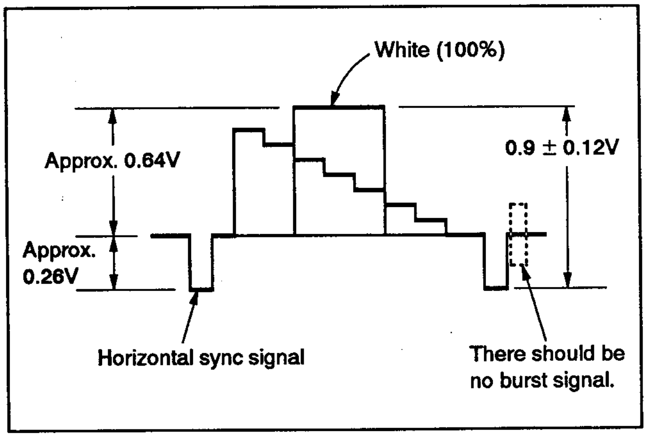


Fig. 7-3. Color bar signal whose chroma signal and burst signals are turned off

1. Current consumption adjustment (VF-69 board)

Mode	Stop
Signal	Color bar signal whose chroma signal and burst signal are turned off.
Measurement Point	Remove L953 and measure +: Pin ① of CN951 –: ⊕ pin of C958
Measuring Instrument	Ammeter
Adjustment Element	RV951
Specified Value	72 ± 5 mA

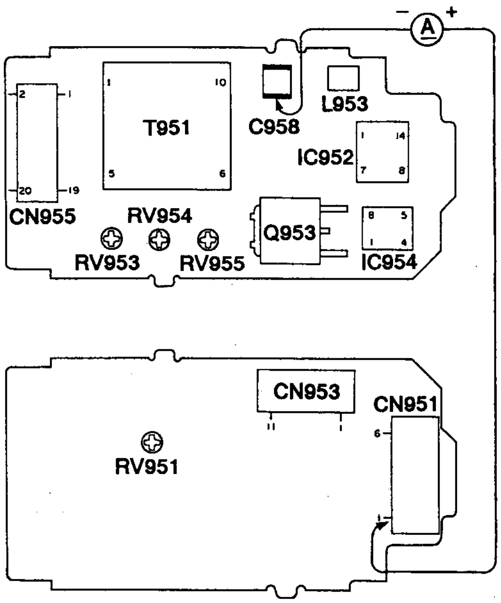
Note 1: Adjust within 30 secs. after the power supply has been turned on.

Note 2: After adjusting, connect L953.

Adjusting method:

1. Check that the voltage of Pin ① of CN951 is 6.0 ± 0.1 Vdc.
2. Adjust the current consumption to 72 ± 5 mA with RV951.

VF-69 board Component side



A
–
+
T951
C958
L953
IC952
CN955
RV954
RV953
RV955
Q953
IC954
CN953
CN951
RV951

VF-69 board Conductor side

Fig. 7-4.

2. Power supply voltage check (VF-68 Board)

Mode	Stop
Measuring Instrument	Digital voltmeter
+12V check	
Measurement Point	Pin ⑥ of CN801 (12V)
Specified Value	+11.6 ± 0.2 Vdc
+13.5V check	
Measurement Point	Pin ④ of CN801 (13.5V)
Specified Value	+13.5 ± 0.3 Vdc

Checking Method:

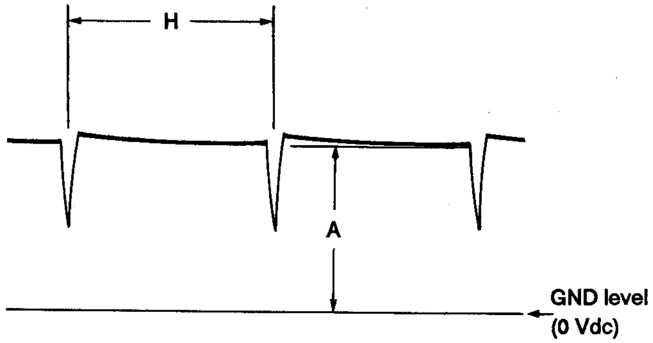
1. Check that the UNREG power supply voltage (Pin ① of VF-69 board CN951) of CN951 is 6.0 ± 0.1 Vdc.
2. Check that each power supply voltage satisfies the specified value.

3. VCO adjustment (VF-68 Board)

Mode	Stop
Signal	Color bar
Measurement Point	Pin ⑩ of CN801 (PCO)
Measuring Instrument	Oscilloscope (DC range)
Adjustment Element	RV804
Specified Value	A=2.8 ± 0.1V

Adjusting method:

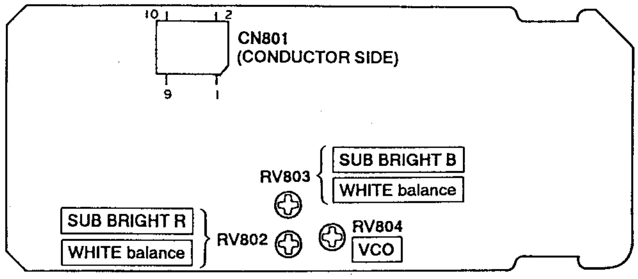
1. Check the GND level of the oscilloscope.
2. Adjust the PCO voltage (A) to the specified value with RV804.



H
A
GND level
(0 Vdc)

Fig. 7-5.

VF-68 BOARD (COMPONENT SIDE)



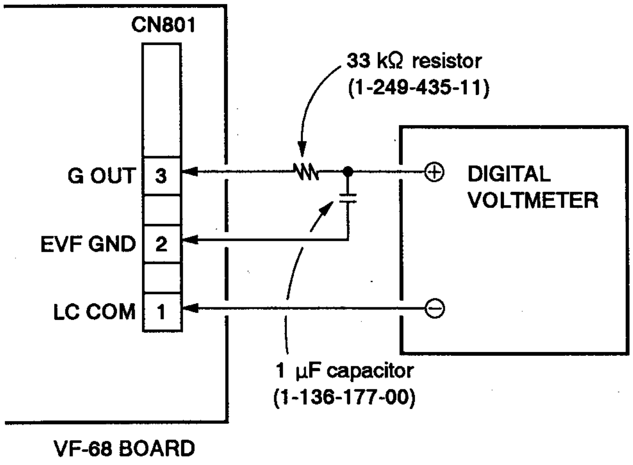
CN801
(CONDUCTOR SIDE)
RV803
SUB BRIGHT B
WHITE balance
SUB BRIGHT R
WHITE balance
RV802
RV804
VCO

4. LC COM voltage check (VF-68 Board)

Mode	Stop
Signal	Color bar signal whose chroma signal and burst signal are turned off
Measurement Point	+: Pin ③ of CN801 (G OUT) –: Pin ① of CN801 (LC COM)
Measuring Instrument	Digital voltmeter
Specified Value	A=+0.35 ± 0.1 Vdc

Connection:

1) Connect the digital voltmeter as shown in the following figure.

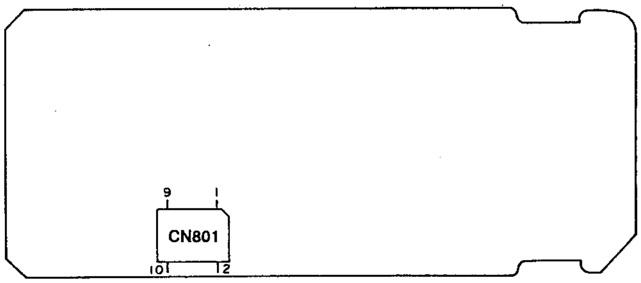


CN801
33 kΩ resistor
(1-249-435-11)
G OUT
3
EVF GND
2
LC COM
1
⊕
⊖
DIGITAL VOLTMETER
1 µF capacitor
(1-136-177-00)
VF-68 BOARD

Checking method:

1. Check that the voltage difference (A) satisfies the specified value.

VF-68 BOARD (CONDUCTOR SIDE)



9
1
CN801
10
2

5. BRIGHT adjustment (VF-69 Board)

Mode	Stop
Signal	No signal
Measurement Point	Pin ③ of CN801 of VF-68 board (G OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV953
Specified Value	A=7.2 ± 0.1V

Adjusting method:

1. Adjust the potential difference (A) between the reversed waveform pedestal and the non reversed waveform pedestal to the specified value with RV953.

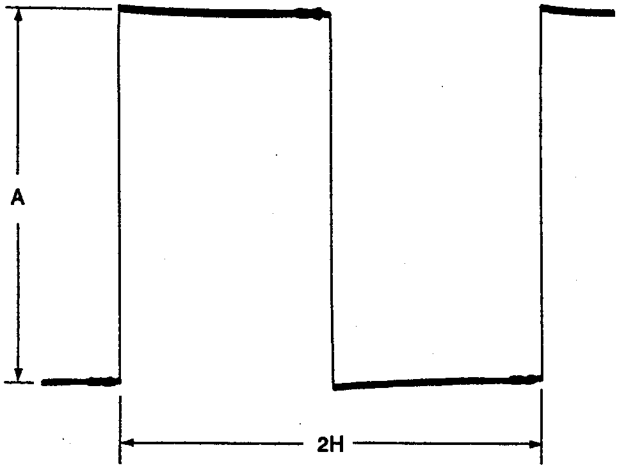
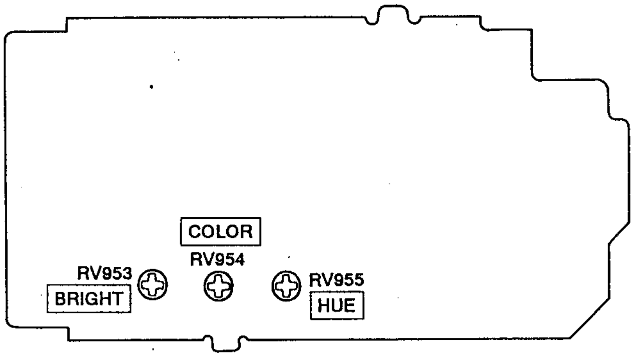


Fig. 7-6.

VF-69 BOARD (COMPONENT SIDE)



COLOR
RV954
RV953
BRIGHT
RV955
HUE

6. CONTRAST check (VF-68 Board)

Mode	Stop
Signal	Color bar signal whose chroma signal and burst signal are turned off
Measurement Point	Pin ③ of CN801 (G OUT)
Measuring Instrument	Oscilloscope
Specified Value	A=2.1 ± 0.1V

Checking method:

1. Check that the white 100% level (A) is the specified value.

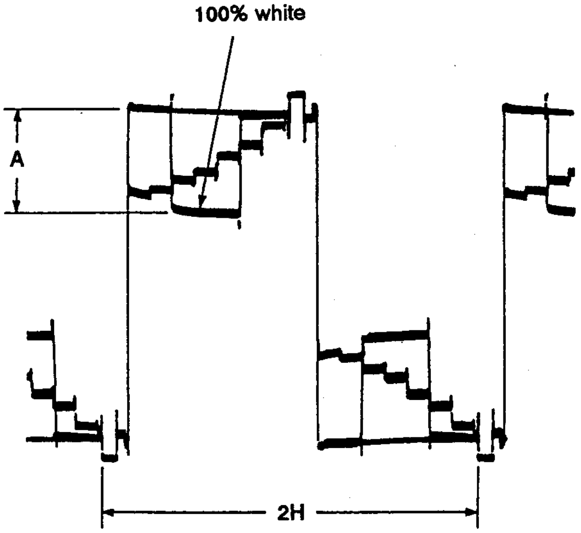
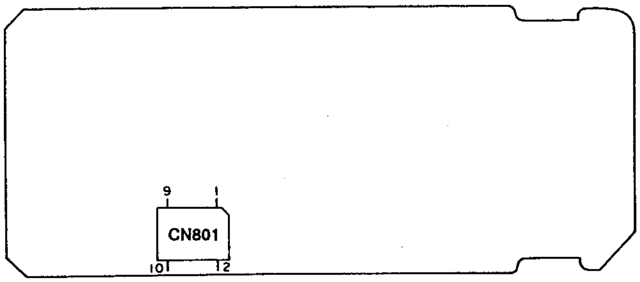


Fig. 7-7.

VF-68 BOARD (CONDUCTOR SIDE)


9
1
CN801
10
12

7. SUB BRIGHT R preset adjustment (VF-68 Board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑦ of CN801 (R OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV802
Specified Value	A=7.2 ± 0.1V

Adjusting method:

1. Adjust the potential difference (A) between the reversed waveform pedestal and the non reversed waveform pedestal to the specified value with RV802.

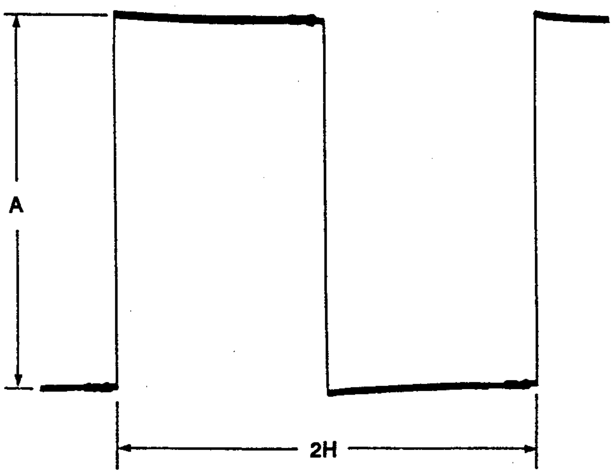
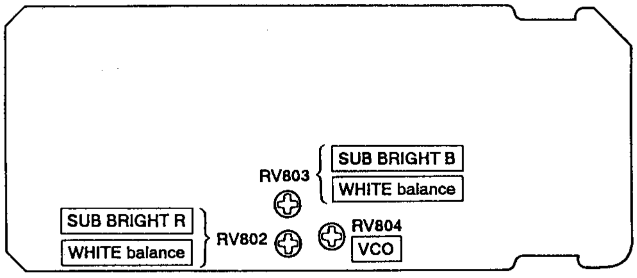


Fig. 7-8.

VF-68 BOARD (COMPONENT SIDE)


RV803
SUB BRIGHT B
WHITE balance
SUB BRIGHT R
WHITE balance
RV802
RV804
VCO

8. SUB BRIGHT B preset adjustment (VF-68 Board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of CN801 (B OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV803
Specified Value	A=7.2 ± 0.1V

Adjusting method:

1. Adjust the potential difference (A) between the reversed waveform pedestal and the non reversed waveform pedestal to the specified value with RV803.

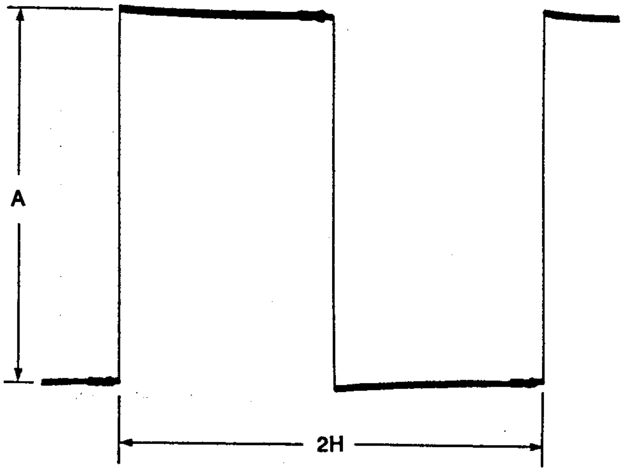


Fig. 7-9.

9. White balance adjustment (VF-68 Board)

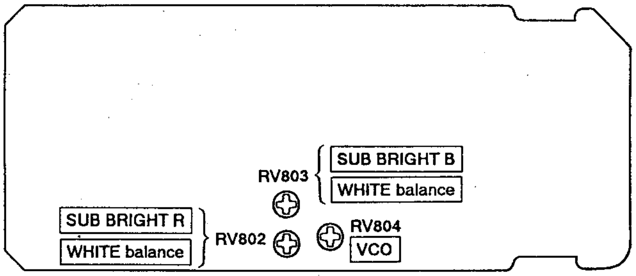
Mode	Record
Signal	Color bar signal whose chroma signal and burst signal are turned off
Measurement Point	Check on LCD display
Measuring Instrument	
Adjustment Element	R: RV802 B: RV803
Specified Value	Picture should not be colored

Note: Turn on the power supply and adjust after more than one minute.

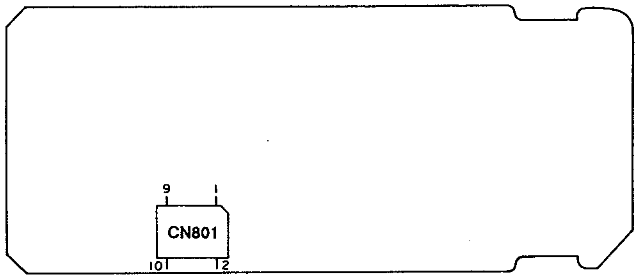
Adjusting method:

1. Check that the LCD display is not colored.
   If it is, adjust RV802 and RV803.

VF-68 BOARD (COMPONENT SIDE)



VF-68 BOARD (CONDUCTOR SIDE)



Sony Corporation
Personal Video Group

English
93H0936-1
Printed in Japan
© 1993. 8
Published by CV Quality Engineering DIV.

CCD-TR61/TR323
RMT-507

SERVICE MANUAL

US Model
Canadian Model
CCD-TR61
E Model
CCD-TR323

Remote commander is available as a unit. But as individual parts the battery case lid of commander is only avaiable.

Video8
Handycam
A MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

SPECIFICATIONS

Video Camera Recorder

System

Video recording system	Two rotary heads, Helical scanning FM system
Audio recording system	Two rotary heads, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette (standard 8 mm)
Tape speed	SP mode: Approx. 1.43 cm (19/32 inches)/s LP mode: Approx. 0.72 cm (5/16 inches)/s (playback only)
Recording time	SP mode: 2 h (P6-120)
Playback time	SP mode: 2 h (P6-120) LP mode: 4 h (P6-120)
Fastforward/rewind time	Approx. 6 min 30 s (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (monochrome)
Lens	Combined 10 x Power zoom lens f = 6.2 to 62 mm (1/4 to 2 7/16 inches) F 1.6 to 2.9 (45 to 450 mm when converted to a 35 mm still camera) Attached 0.7 x Wide Angle lens f = 4.4 mm F 1.6 (32 mm when converted to a 35 mm still camera) TTL autofocus system inner focus wide macro system
Color temperature	Auto
Minimum illumination	1 lx (F 1.6)
Illumination range	1 lx to 100,000 lx
Recommended illumination	More than 100 lx

Input and output connectors

Video output	Phono jack, 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio output	Phono jacks –7.5 dBs, (at load impedance 47 kΩ) impedance less than 2.2 kΩ
RFU DC OUT	Special minijack, DC 5 V
Remote jack	Stereo mini-minijack (ø 2.5 mm)
MIC jack	minijack, – 66 dBs low impedance with 2.5 to 3 V DC, output impedance 6.8 kΩ (ø 3.5 mm)

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Average power consumption	6.0 W (camera recording) including the viewfinder

— Continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

Installation	Vertically, Horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 109 x 109 x 188 mm (w/h/d) (4 3/8 x 4 3/8 x 7 1/2 inches)
Mass	About 790 g (1 lb 11 oz) excluding the battery pack, lithium battery, cassette, and shoulder strap About 1,005 g (2 lb 3 oz) including the battery pack NP-55, lithium battery CR2025, cassette P6-120, and shoulder strap
Microphone	Electric condenser microphone, stereo type

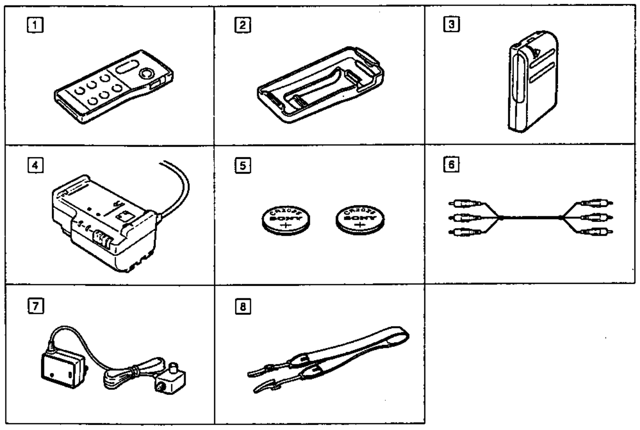
AC power adaptor

Power requirements	110 — 240 V AC*, 50/60 Hz
Power consumption	15 W
Output voltage	DC OUT: 7.5 V, 1.2 A in operating mode Battery charge terminal: 10 V, 1.1 A in charge mode
Application	Sony battery packs NP-55/-55H, NP-66/-66H, NP-77/-77H/-77HD
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to 60°C (–4°F to 140°F)
Dimensions	Approx. 103 x 49 x 63 mm (w/h/d) (4 1/8 x 1 15/16 x 2 1/2 inches) including projecting parts and controls
Weight	Approx. 290 g (10 oz)

* Canadian Standard Association (CSA) certifies 120 V AC only.

Design and specifications are subject to change without notice.

Supplied accessories



1 **Wireless Remote Commander** (1) (p. 43)

2 **Remote Commander holder** (1) (p. 44)

3 **Battery pack NP-55** (1) (p. 6)

4 **AC power adaptor AC-V25** (1) (p. 6, 48)

5 **Lithium Battery CR2025** (2) (p. 10)
(One is for the camcorder and the other is for the Remote Commander)

6 **A/V connecting cable** (1) (p. 22)

7 **RFU adaptor RFU-90UC** (1) (p. 22)

8 **Shoulder strap** (1) (p. 44)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

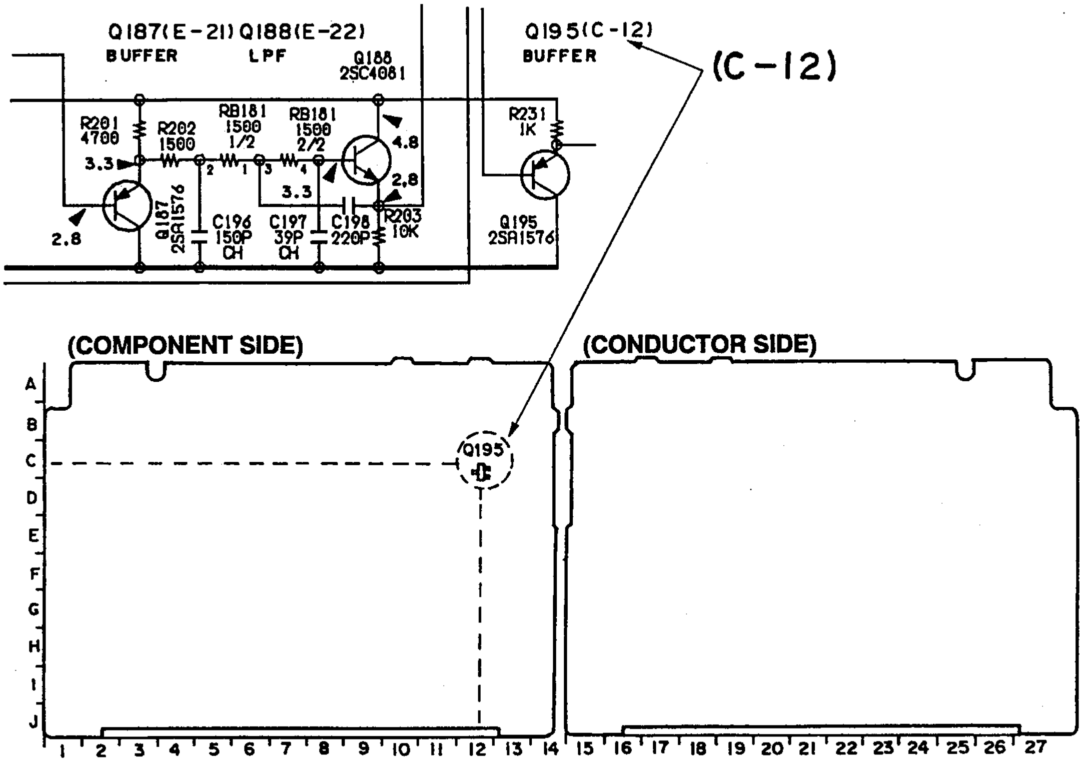
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 102, 103, 113, 115, 145 and 147.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red in schematic diagrams. This enables to find the location on the board easily when servicing.



Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
4.8
2.8
3.3
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1
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[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [⊗] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

SECTION 1
GENERAL

This section is extracted from CCD-TR61 instruction manual.

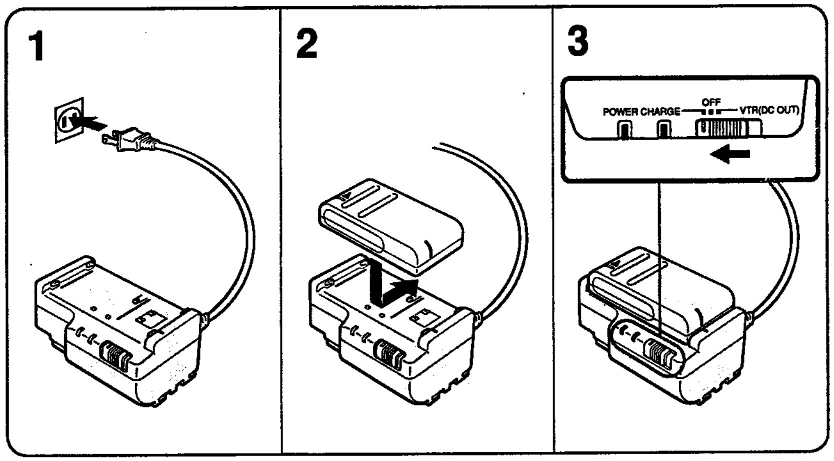
Getting Started

Charging and Installing the Battery Pack

Before using your camcorder, you first need to charge and install the battery pack. To charge the battery pack, use the supplied AC-V25 AC power adaptor.

Charging the Battery Pack

Charge the battery pack on a flat place without vibration. (1) Connect the power cord to a wall outlet. (2) Align the right side of the battery pack with the white line on the AC power adaptor, then slide the battery pack in the direction of the arrow. (3) Set the selector to CHARGE. The POWER lamp (green) and the CHARGE lamp (orange) light up. Charging begins.
When charging is completed, the CHARGE lamp goes out. Set the selector to OFF and unplug the unit from the wall outlet. Then remove the battery pack and install it on the camcorder. To stop charging, set the selector to OFF.



Charging Time and Battery Life

Battery pack	NP-55 (supplied)	NP-77H NP-77HD	NP-77	NP-66H	NP-55H
Charging time*	70	160	140	120	80
Battery life**	50	135	105	100	60

* Approximate charging time to charge an empty battery pack using the AC-V25 (Lower temperatures require a longer charging time.)
** Approximate continuous recording time indoors

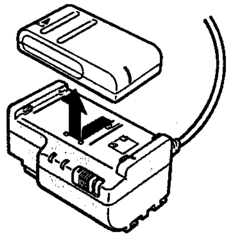
Important!

Use the battery completely before re-charging!

Before you recharge the battery, make sure the battery has been used up (discharged) completely. Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.

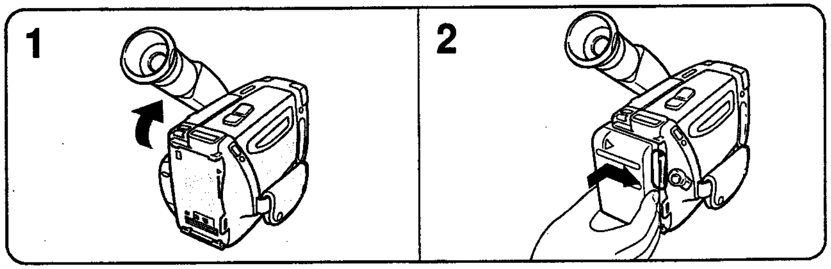
To use up the battery, remove the cassette and slide the POWER switch to CAMERA with the battery attached, and leave the camcorder until the ▭ indicator and the red lamp flash in the viewfinder.

Removing the Battery Pack
Slide the battery pack in the direction of the arrow (see drawing).

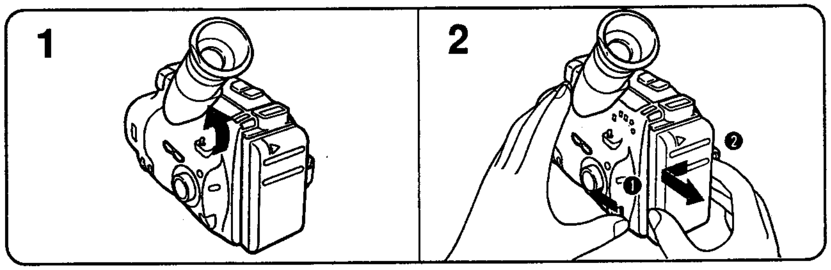


Installing the Battery Pack

(1) Lift up the viewfinder. (2) Align the right side of the battery pack with the white line on the camcorder, and slide the battery pack to the right.



Removing the Battery Pack
(1) Lift up the viewfinder. (2) While pressing BATT, slide the battery pack to the left.



Note on charging the battery pack
- The POWER lamp will remain lit for a while even if the battery pack is removed and the power cord is unplugged after charging the battery pack. This is normal.
- If the POWER lamp does not light, set the selector to OFF and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to CHARGE again.
- You cannot operate the camcorder using the AC power adaptor while charging the battery pack.

Tips for Using the Battery Pack

This section shows you how you can get the most out of your battery pack.

Preparing the Battery Pack

Always Carry Additional Batteries

Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.
"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, placed at room temperature using a fully-charged battery.

Battery Life is Shorter in Cold Environment

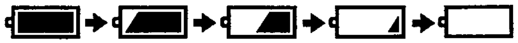
Battery efficiency is decreased and the battery will be used up more quickly if you are recording in cold environment.

To Save Battery Power

Turn the STANDBY switch on the camcorder down when not recording to save battery power. **[a]**
A smooth transition between scenes can be made even if recording is stopped and started again. While positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

When to Replace the Battery Pack

While you are using your camcorder, the remaining battery indicator decreases gradually as battery power is used up.



When the remaining battery indicator reaches the lowest point, the 🔋 indicator appears and starts flashing in the viewfinder. **[b]**
When the 🔋 indicator in the viewfinder changes from slow flashing to rapid flashing while you are recording, slide the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain smooth transition between scenes after the battery pack is replaced.

Note on the remaining battery indicator
The remaining battery indicator of the camcorder may indicate a different remaining capacity from that of the NP-77HD battery pack (not supplied). The indicator of NP-77HD is more accurate.

Note on the Rechargeable Battery Pack

The Battery Heats Up

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern.

Battery Care

- Remove the battery pack from the camcorder after using the battery pack, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF, which shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore, you should charge the battery right before using the camcorder.

How to Use the Switch on the Battery Pack

This switch is provided so that you can mark the charged battery. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up (or in whichever direction you want to remind yourself). **[c]**

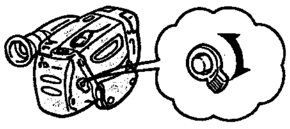
The Life of the Battery Pack

The battery pack can be fully charged and discharged about 500 times under normal temperatures. If the battery indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

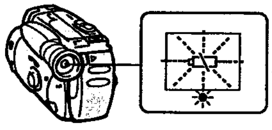
Charging Temperature

You should charge batteries at temperatures from 10°C to 30°C (from 50°F to 86°F). Lower temperatures require a longer charging time.

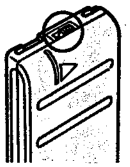
[a]



[b]



[c]



Note on Charging

A Brand-new Battery

A brand-new battery pack is not charged. Before using the battery pack, charge it completely.

Before Recharging a Used Battery Pack

- Make sure to use up the battery before recharging.
- If recording is completed before the 🔋 indicator appears in the viewfinder, you should remove the tape, slide the POWER switch to CAMERA, turn up the STANDBY switch, and leave the camcorder until the battery indicator flashes rapidly.
- When you use the AC-S10 power adaptor, the DC-S10 car battery charger or BC-S10 portable battery charger, you can use the discharging function.
- **Charging the usable battery causes a lowering of battery capacity. Battery capacity can be recovered if you fully discharge and charge the battery again.**

After Long Storage

Recharge the battery pack after a long period of storage. If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Note on the Terminals

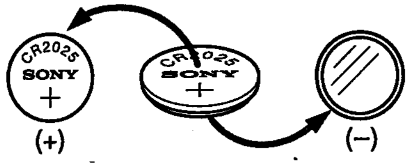
If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, repeat installing and removing the battery pack. This improves the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Be Sure to Observe the Following

- **To prevent an accident caused by a short circuit, do not allow metal objects such as a necklace to touch the battery terminals. Carry the battery pack attaching to the terminal cover.**
- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor convert the battery pack.
- Do not expose the battery pack to any mechanical shock

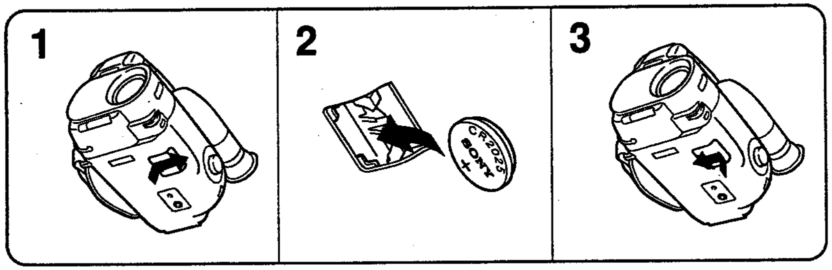
Inserting the Lithium Battery

Your camcorder is supplied with two lithium batteries. One is for the camcorder, and the other is for the Remote Commander. The lithium battery has a positive (+) side and a negative (–) side as illustrated below. Be sure to install the lithium battery with the positive side facing out.

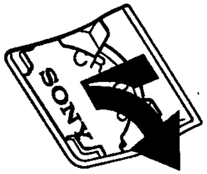


Inserting the Lithium Battery into the Camcorder

To activate the clock and the world clock, you must insert a lithium battery. (1) Detach the lid of the lithium battery compartment on the bottom of the camcorder. (2) Install the lithium battery with the positive (+) side facing out. (3) Replace the lid.

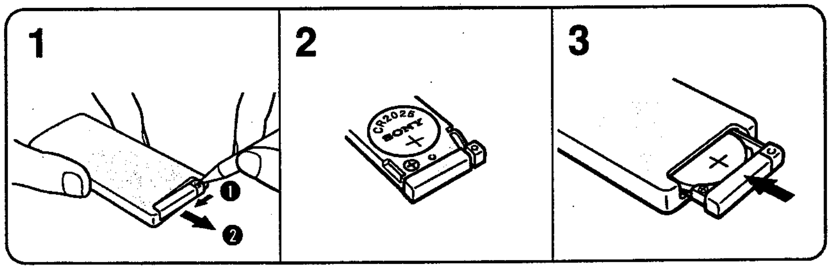


To Remove the Lithium Battery
Push the Battery down once and pull it out from the holder.
When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date and time.



Inserting the Lithium Battery into the Remote Commander

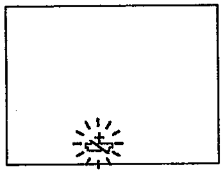
To use the Remote Commander, you must insert the lithium battery. Use one of the supplied CR2025 lithium batteries. (1) Pull out the lithium battery holder from the Remote Commander. (2) Insert the lithium battery with the positive (+) side facing upward. (3) Put the lithium battery holder back into the Remote Commander.



Lithium Battery Life
The lithium battery for the camcorder lasts for about 1 year under normal operation. When the battery becomes weak or dead, the indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA.

The lithium battery for the Remote Commander lasts about 6 months under normal operation. When the battery becomes weak or dead, the Remote Commander does not work.

In either case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion.**

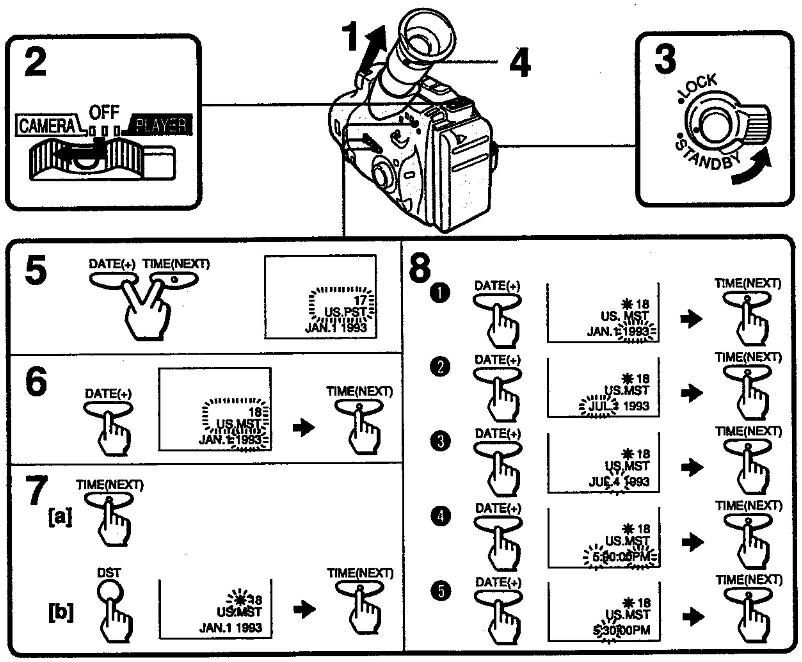


WARNING
The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution
Keep the lithium battery out of the reach of children.
Should the battery be swallowed, consult a doctor immediately.

Setting the Date and Time

You need to set the camcorder's date and time to record the correct ones onto your video. Before setting the clock, make sure a power source and lithium battery are installed. (1) Pull out the viewfinder until it clicks. (2) While pressing the small green button on the POWER switch, slide it to CAMERA. (3) Turn the STANDBY switch to STANDBY. (4) Turn the viewfinder lens adjustment ring so that the "STBY" indicator in the viewfinder comes into sharp focus. (5) Press DATE (+) and TIME (NEXT) simultaneously until the area name and number appear in the viewfinder. (6) Press DATE (+) to set your home area. (See the table below.) (7) Set the Time: **[a]** For standard time, press TIME (NEXT). **[b]** For Daylight Saving Time, press DST and then press TIME (NEXT). (8) Adjust the flashing digits of the year, month, day and hour and minutes by pressing DATE (+) and TIME (NEXT). Note that when you keep DATE (+) pressed, the digits advance faster.


2
CAMERA
OFF
PLAYER
1
4
3
LOCK
STANDBY
5
DATE(+) TIME(NEXT)
17
US.PST
JAN.1 1993
6
DATE(+)
18
US.MST
JAN.1 1993
TIME(NEXT)
7
[a]
TIME(NEXT)
[b]
DST
18
US.MST
JAN.1 1993
TIME(NEXT)
8
❶
DATE(+)
18
US.MST
JAN.1 1993
TIME(NEXT)
❷
DATE(+)
18
US.MST
JUL.1 1993
TIME(NEXT)
❸
DATE(+)
18
US.MST
JUL.4 1993
TIME(NEXT)
❹
DATE(+)
18
US.MST
5:00:00PM
TIME(NEXT)
❺
DATE(+)
18
US.MST
5:30:00PM
TIME(NEXT)

Time Zone	Area Name	Area Number
Hawaii Standard Time	HAWAII	15
Alaska Standard Time	ANCHRGE	16
Pacific Standard Time Western Canada	US. PST	17
Mountain Standard Time	US. MST	18
Central Standard Time	US. CST	19
Eastern Standard Time Eastern Canada	US. EST	20

To Correct the Date and Time Settings

Press TIME (NEXT) repeatedly until the minute digits stop flashing. Then repeat steps 5 to 8.

To Check the Preset Date and Time

Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

To Reset to Standard Time

Press DST. The ✷ indicator goes off.

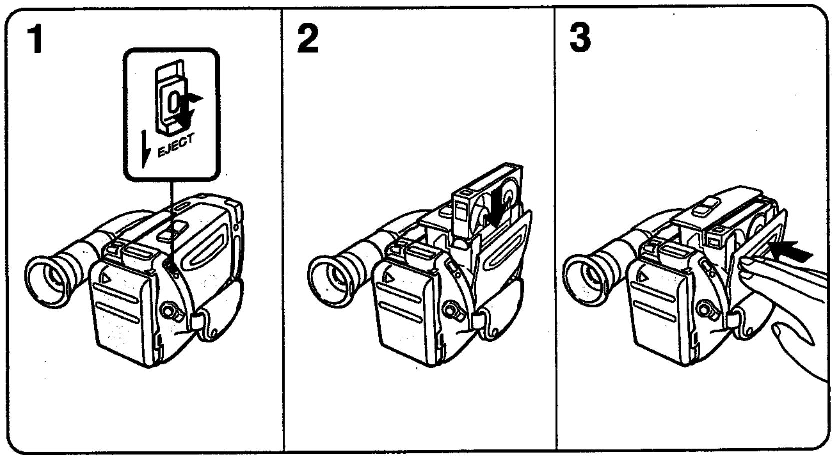
Note on the setting of the year

When you set the year, each time you press DST the digits change as follows.

1993 → 1994 → ---- → 2020

Inserting a Cassette

Make sure that the power source is installed. (1) While pressing the small blue button on the EJECT knob, slide it down. The cassette holder automatically lifts up and opens. (2) Insert a tape with the window facing out. (3) Close the cassette holder by pressing the "PUSH" mark on the cassette holder.

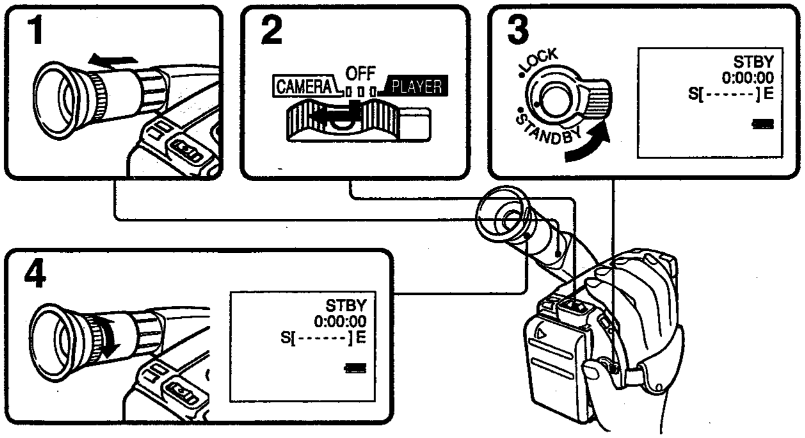


To Eject the Cassette

While pressing the small blue button on the EJECT knob, slide it down.

Adjusting the Viewfinder Lens

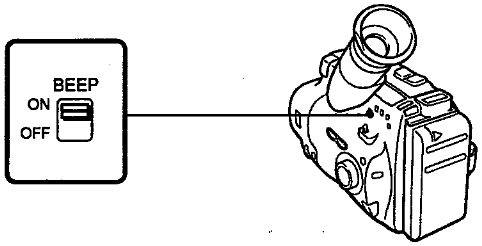
Before you use the camcorder for the first time or after someone else has used it, focus the viewfinder lens. Make sure that the power source is attached to the camcorder. (1) Pull out the viewfinder until it clicks. (2) While pressing the small green button on the POWER switch, slide it to CAMERA. (3) Turn the STANDBY switch to STANDBY. (4) Turn the viewfinder lens adjustment ring so that the indicators in the viewfinder come into sharp focus.



BEEP Feature

A beep sounds when you start recording and two beeps sound when you stop recording, confirming the operation.

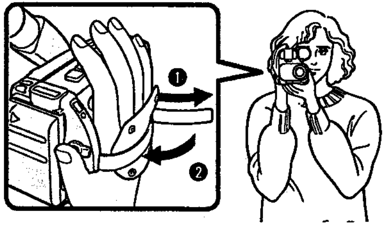
Several beeps also sound as a warning of any unusual condition of the camcorder. Note that the beep sound is not recorded on the tape. If you do not want to hear the beep sound, set BEEP to OFF.



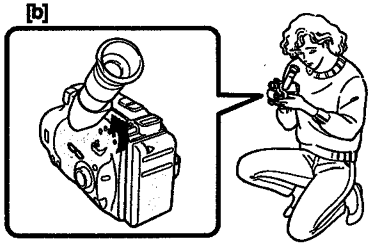
Hints for Better Shooting

For hand-held shots, you'll get better results by holding the camcorder according to the following suggestions:

[a]



[b]



- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb. **[a]**
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Turn the viewfinder up for recording from a low position. **[b]**

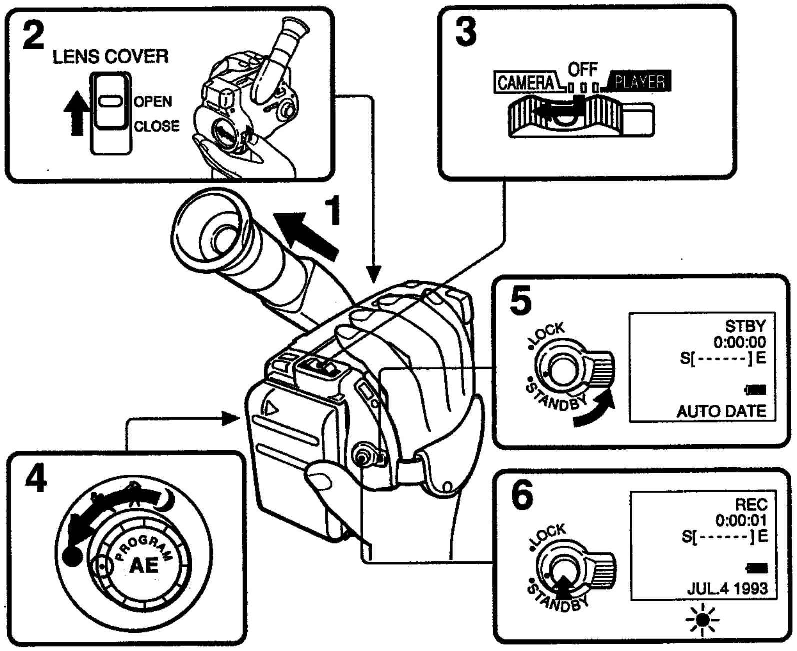
Place the camcorder on a flat surface or use a tripod

Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder (p. 41). Make sure the tripod screw is shorter than 6.5 mm (9/32 in).

Basic Operations

Camera Recording

Make sure that the power source is installed and a cassette is inserted. If you set the date (p. 12), the date is automatically recorded for 10 seconds after you start recording (AUTO DATE feature). This feature works only once a day. You can use the Remote Commander to record yourself with your friends or family. When you use the Remote Commander, make sure that the REMOTE COMMANDER switch on the camcorder is set to ON (p. 43).
Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working perfectly. (1) Pull out the viewfinder until it clicks. (2) Slide the LENS COVER switch to OPEN. (3) While pressing the small green button on the POWER switch, slide it to CAMERA. (4) Set the white mark of the PROGRAM AE dial to the green position. (5) Turn the STANDBY switch to STANDBY. Adjust the viewfinder lens so that the indicators in the viewfinder come into sharp focus (p. 14). (6) Press START/STOP. The camcorder starts recording and the red lamp lights up in the viewfinder.



To Stop Recording Momentarily

Press START/STOP again. The "STBY" indicator appears in the viewfinder (**Standby mode**).

To Finish Recording

Turn the STANDBY switch to LOCK and slide the POWER switch to OFF. Slide the LENS COVER switch to CLOSE and eject the tape (p. 13).

Notes on Standby mode
If you leave the camcorder in Standby mode for 5 minutes, the camcorder goes off automatically. This prevents wearing down the battery and wearing out the tape. To resume Standby mode, turn the STANDBY switch to LOCK once and turn it to STANDBY again. To start recording, press START/STOP.

Note on the tape counter
The tape counter indicates the recording or playback time. Use it as a guide. There will be a time lag of several seconds from the actual time. To set the counter to zero, press COUNTER RESET.

Note on the AUTO DATE feature
The AUTO DATE feature works once a day. However, the date may automatically appear more than once a day when:

- you reset the date and time.
- you eject and insert the tape again.
- you stop recording within 10 seconds.

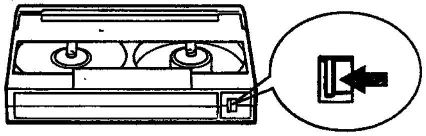
If you wear glasses
You can bend back the eyecup to get a better view of the viewfinder.

When moving from indoors to outdoors (or vice versa)
Turn the STANDBY switch to STANDBY and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

Note on recording
When you record from the beginning of a tape, run the tape for about 15 seconds before starting the actual recording. This will ensure that you won't miss any start-up scenes when you playback the tape. You can record tapes in SP (standard play) mode only.

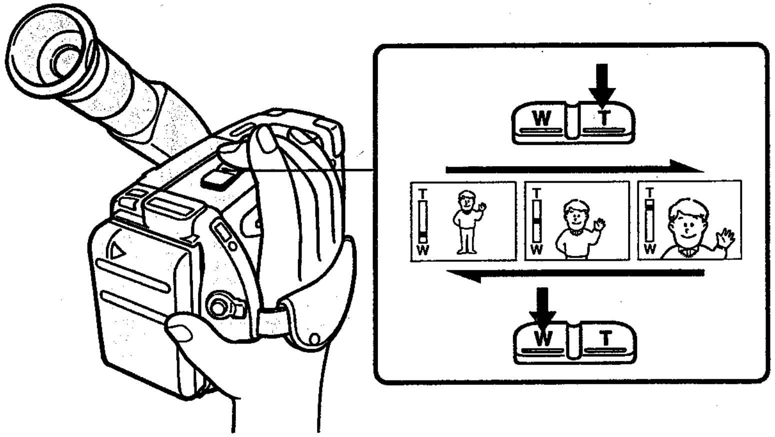
Preventing Accidental Erasure

To prevent accidental erasure, slide the tab on the cassette to expose the red mark. If you try to record with the red mark exposed, the 📼 and ▲ indicators flash in the viewfinder, and you cannot record. To re-record on this tape, slide the tab back out covering the red mark.



Using the Zoom Feature

Zooming is a recording technique that lets you change the size of the subject in the scene. You can also use the zoom to focus manually or to decide on a shooting angle before you start recording.
For more professional-looking recordings, use the zoom function sparingly.
"T" side: for telephoto (subject appears closer)
"W" side: for wide-angle (subject appears farther away)



Zooming Speed (Dual speed zooming)

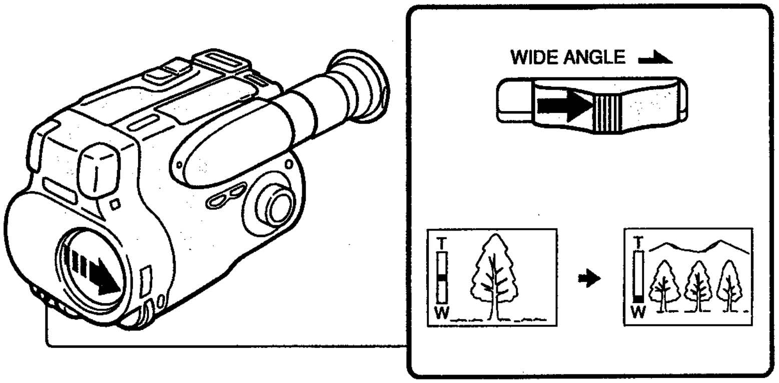
Press the power zoom button firmly for a high-speed zoom, press it softly for a relatively slow zoom.

When you shoot a subject using a telephoto zoom
If you cannot get a sharp focus while in extreme telephoto zoom, press the "W" side of the power zoom button until the focus is sharp. You can shoot a subject that is at least 80 cm (about 31 1/2 inches) away from the lens surface in the telephoto position, or 1 cm (about 1/2 inches) in the wide-angle position.

Manual focusing in macro
You can also shoot with manual focus while doing close-ups (p. 27).

Using the WIDE ANGLE

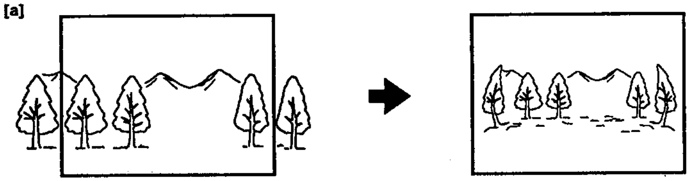
The WIDE ANGLE delivers wide-angle pictures easily. Set the WIDE ANGLE switch in the direction of the arrow.



Note on using the WIDE ANGLE

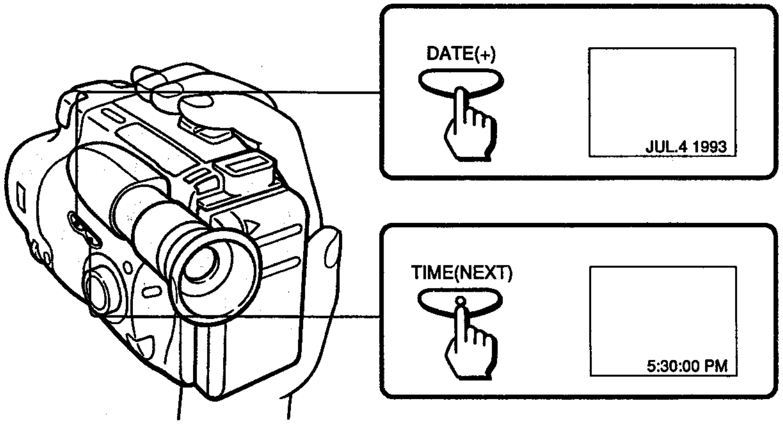
- When you use the WIDE ANGLE, the power zoom button does not function.
- When you use the WIDE ANGLE, zooming is automatically set to the maximum wide-angle setting. The power zoom indicator stays at the end of the "W" side.
- The frame of the picture through the WIDE ANGLE changes [a] and the picture has slightly lower quality.
- When you use the WIDE ANGLE together with the auto-focus function in the following types of situations, the camera will focus not on the subject but on the light source. In this event, either orient the camera so that light does not enter the frame directly, or else use focus the shot manually.
  - When shooting into the light
  - When shooting a subject that gives off a large amount of light
- If there is dust between the regular lens and the WIDE ANGLE, the subjects may become out of focus. Remove the dust by using a blower.
- You cannot use any optional lens or filter with the WIDE ANGLE.

[a]



Recording the Date or Time

While you are recording, press DATE (+) or TIME (NEXT). The date or time displayed in the viewfinder is recorded with the picture. You cannot record the date and time at the same time. Except for the date or time indicator, no indicator in the viewfinder is recorded.

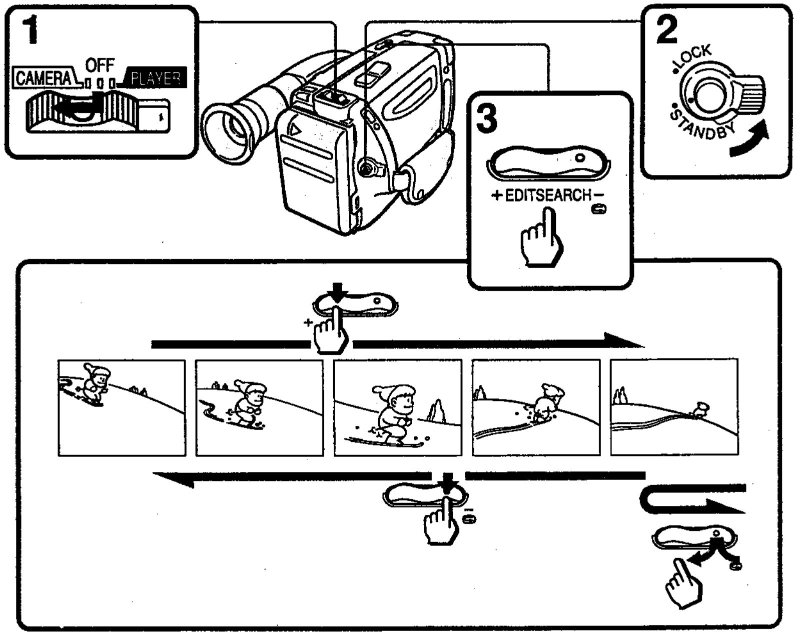


To Stop Recording with the Date and Time

Press DATE (+) or TIME (NEXT) again. The date or time indicator disappears. The recording continues.

Checking the Recorded Picture in the Viewfinder

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder. (1) While pressing the small green button on the POWER switch, slide it to CAMERA.
(2) Turn the STANDBY switch to STANDBY. (3) Press the – (⊖) side of EDITSEARCH momentarily; the last few seconds of the recorded portion plays back (**Rec Review**).
Keep pressing EDITSEARCH to play back the last recorded portion (**Edit Search**).
+ side: to view the forward playback picture
– side: to view the reverse playback picture



To Stop Playback

Release EDITSEARCH.

To Begin Re-recording

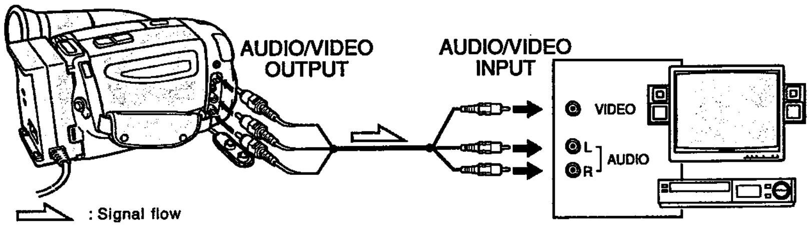
Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the tape, the transition between the last scene you recorded and the next scene you record will be smooth.

Connections for Playback

You can use this camcorder as a VCR by connecting it directly to your TV for playback. There are several ways to connect the camcorder to your TV.

Connecting to a TV with Audio/Video Input Jacks or VCR

Connect the camcorder to the TV using the supplied A/V connecting cable. Set the TV/VCR selector on the TV to VCR.

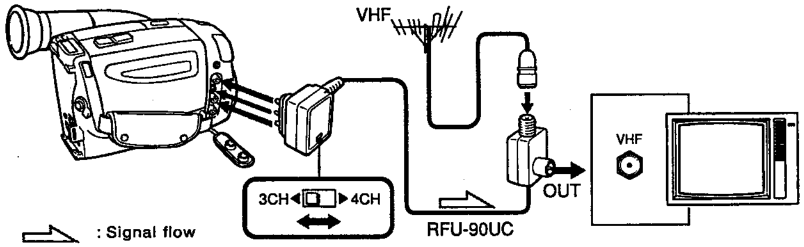


If your TV or VCR is a Monaural Type
Connect only the white plug for audio on both the camcorder and the TV or the VCR. With this connection, the sound is in monaural.

Note on playing back a bilingual tape
You can listen to the main sound (only) by connecting the L ch plug. If you connect both L ch and R ch, the sound from both channels is mixed.

Connecting to a TV without Audio/Video Input Jacks

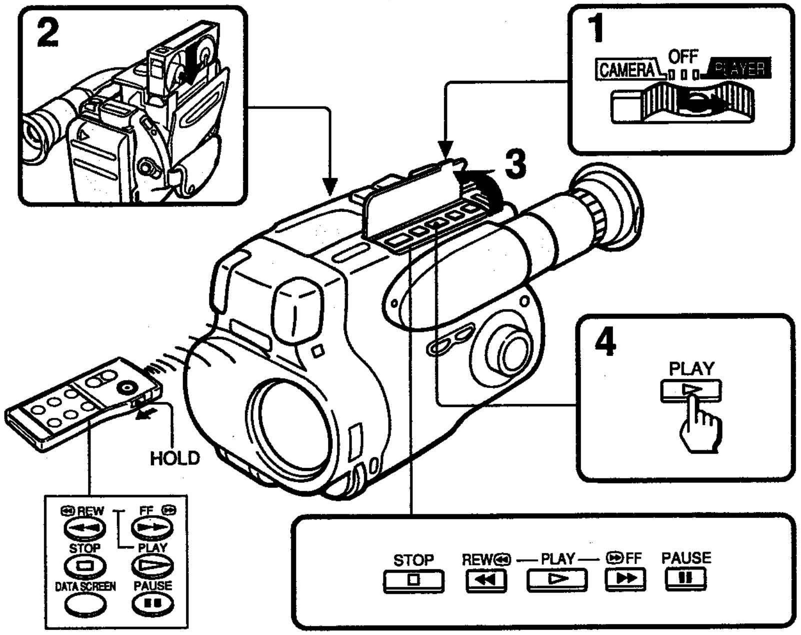
Connect the camcorder to the TV using the supplied RFU adaptor. Make sure that the TV is turned off to prevent speaker damage before hooking up your camcorder. Set the channel selector on the RFU adaptor and your TV to VHF CH 3 or CH 4, whichever is not active in your area. With this connection, the sound is in monaural.



Playing Back a Tape

Playing Back a Tape

You can monitor the playback picture in the viewfinder. You can also monitor the picture on a TV screen, after connecting the camcorder to a TV or VCR (p. 22). You can use the supplied Remote Commander to control playback, if you want. Before using the Remote Commander, slide the HOLD switch in the opposite direction of the arrow. (1) While pressing the small green button on the POWER switch, slide it to PLAYER. (2) Insert the recorded tape with the window facing out. (3) Open the lid of the control panel. (4) Press ▷. Playback starts.



To stop playback, press □ .
To rewind the tape, press ◀◀ .
To fastforward the tape, press ▶▶ .

(See next page for further information.)

Playing Back a Tape

Various Playback Modes

To view a still picture
Press ❚❚ during playback. To resume playback, press ❚❚ or ▷.

To locate a scene (Picture search)
Keep pressing ◀◀ or ▶▶ during playback. To resume normal playback, release the button.

To monitor the high-speed picture during fastforward or rewind (Skip scan)
Keep pressing ◀◀ while rewinding or ▶▶ while advancing the tape. To resume normal playback, press ▷.

To view the picture in a sequence of stop-motion images
Press EDITSEARCH in playback pause mode. If you keep pressing EDITSEARCH, you can view the picture playback in the forward (+) or reverse (–) direction.

Note on playback

- Streaks appear and the sound is muted in the various playback modes.
- When still picture mode lasts for 5 minutes, the camcorder automatically enters stop mode.

To display the viewfinder screen indicators on the TV
Press DATA SCREEN on the Remote Commander. To erase the indicators, press it again.

Advanced Operations

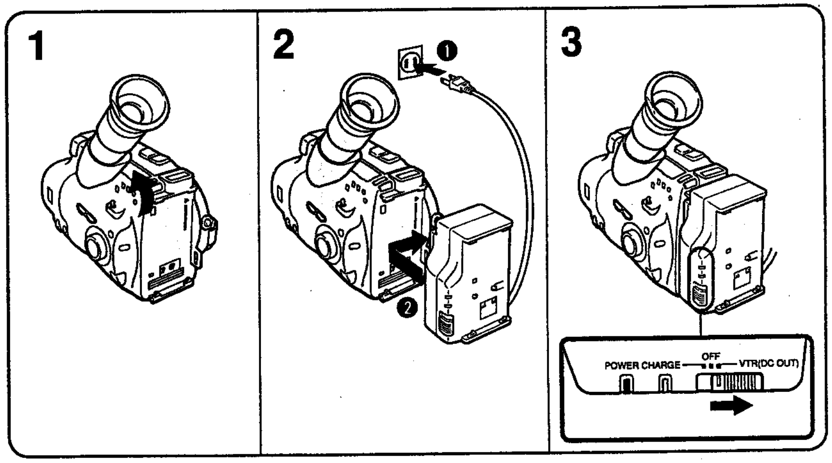
Using Alternate Power Sources

You can choose any of the following power sources for your camcorder: battery pack (p. 7), house current, and 12/24 V car battery. Choose the appropriate power source depending on where you want to use your camcorder.

Place	Power source	Accessory to be used
Indoors	House current	AC power adaptor AC-V25 (supplied), AC-S10, AC-V55
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-77HD, NP-77H, NP-77, NP-66H, NP-55H
In the car	12 V or 24 V car battery	DC pack DCP-77

Using House Current

To use the supplied AC-V25 AC power adaptor: (1) Lift up the viewfinder. (2) Connect the AC power cord to a wall outlet. The POWER lamp (green) lights up. Connect the bottom of the AC power adaptor to the battery mounting surface of the camcorder. (3) Set the selector to VTR (DC OUT).



Note on the POWER lamp

- The POWER lamp will remain lit for a while even if the unit is unplugged after use. This is normal.
- If the POWER lamp does not light, set the selector to OFF and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to VTR (DC OUT) again.

To remove the adaptor
The adaptor is removed in the same way as the battery pack. (p. 7)

Using Alternate Power Sources

Using a Car Battery

Use the DCP-77 DC pack (not supplied). Connect the cord of the DC pack to the cigarette lighter socket of the car (12 V or 24 V). Connect the DC pack to the battery mounting surface of the camcorder.

To remove the DC pack
The DC pack is removed in the same way as the battery pack. (p. 7)

Options for Charging the Battery Pack

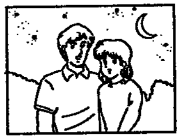
- AC-S10 AC power adaptor:
  You can charge a battery pack whether it is used up or not with this adaptor because it has a discharging function.
- BC-77 or BC-S10 portable battery-charger (ideal for travel):
  You can charge a battery pack on 100 — 240 V AC current.

Focusing Manually

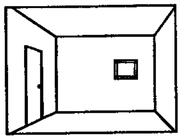
When to Use Manual Focus

In the following cases you should obtain better results by adjusting the focus manually.

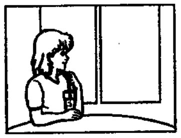
[a]



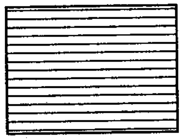
[b]



[c]



[d]



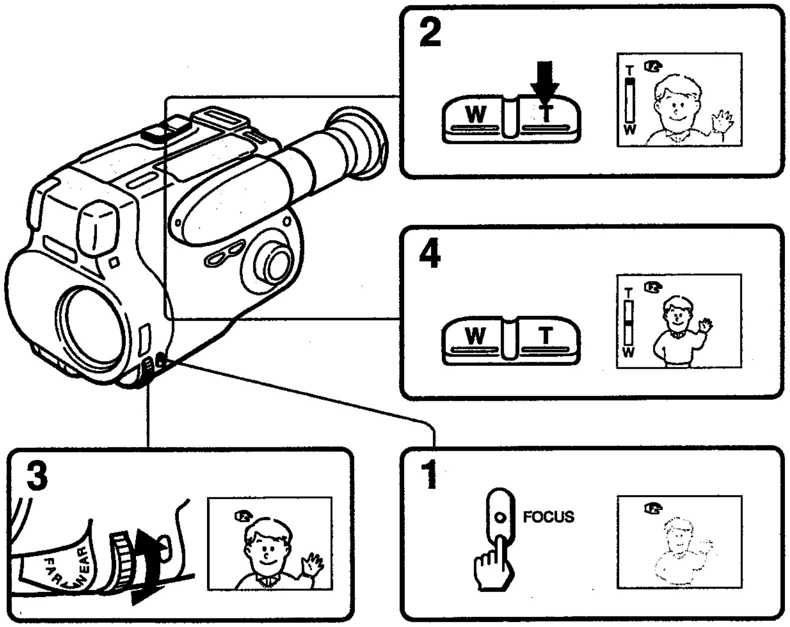
- Insufficient light **[a]**
- Subjects with little contrast — walls, sky, etc. **[b]**
- Too much brightness behind the subject **[c]**
- Horizontal stripes **[d]**
- Subject through frosted glass
- Subjects beyond nets, etc.
- Bright subject or subject reflecting light
- Shooting a stationary subject when using a tripod

Note on using the WIDE ANGLE
Readjust the focus if, while using manual focusing, you have switched to the WIDE ANGLE or if you have switched from the WIDE ANGLE to the normal lens.

Focusing Manually

Focusing Manually

When focusing manually, first focus in telephoto before recording, and then reset the shot length.
(1) Press FOCUS. The Ⓕ indicator appears in the viewfinder. (2) Keep pressing the "T" (telephoto) side of the power zoom button until the zooming stops. (3) Turn the focus dial to achieve a sharp focus.
(4) Set the desired shot length.



To Reactivate Autofocusing
Press FOCUS until the Ⓕ indicator in the viewfinder disappears.

Shooting in relatively dark places
Shoot at wide-angle after focusing in the telephoto position.

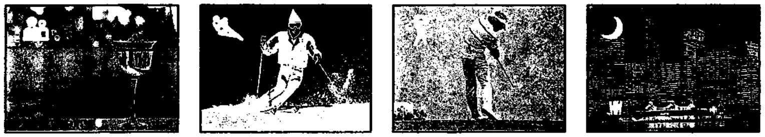
Note on the focus dial
The focus dial does not have a stop position.

Using the PROGRAM AE Function

You can select from four PROGRAM AE (Auto Exposure) modes to suit your shooting situation. When you use PROGRAM AE, you can get a Portrait effect (the subject is in focus and the background is out of focus) or capture high-speed action or record night views.

Selecting the Best Mode

Select one of four modes, referring to the following.



Portrait mode
- A still subject such as a person or a flower
- Zooming in on a subject in the telephoto mode
- A subject behind an obstacle such as a net

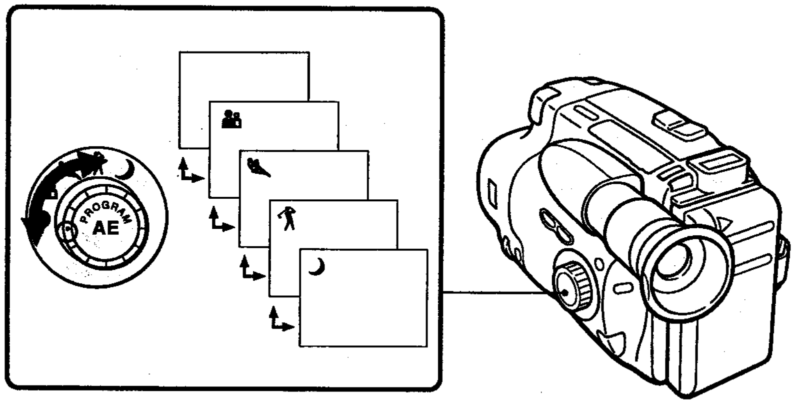
Sports mode
- Outdoor sports scene such as football, tennis, golf or skiing
- A landscape in a moving car

High speed shutter mode
- A golf swing or a tennis match in fine weather with the ball captured clearly
- Playing back certain scenes with high-speed movements in a clear, sharp picture

Twilight mode
- Recording night views, neon signs or fireworks

Using the PROGRAM AE Function

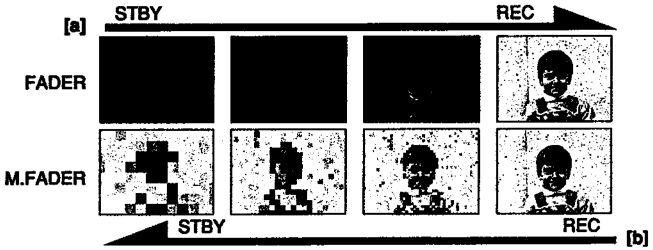
Set the white mark of the PROGRAM AE dial to the desired PROGRAM AE mode. The indicator of the selected PROGRAM AE mode appears in the viewfinder.



Note on shutter speed
The shutter speed in each PROGRAM AE mode is as follows:
Portrait mode — between 1/60 to 1/2000
Sports mode — between 1/60 to 1/500
High-speed shutter mode — 1/4000
Twilight mode — 1/60

Fade-in and Fade-out

You can fade a picture in or out with sound to give your recording a professional appearance. When fading in, you can make the picture gradually appear from black or mosaic while increasing the sound **[a]**. When fading out, you can make the picture gradually fade to black or mosaic while decreasing the sound **[b]**.

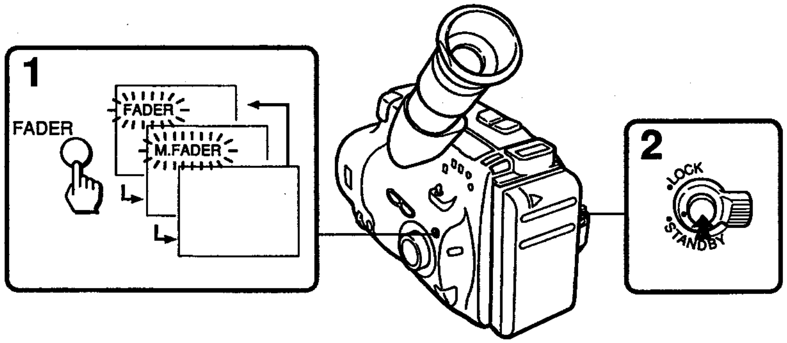

[a]
STBY
REC
FADER
M.FADER
STBY
REC
[b]

When Fading in

(1) During the camcorder is in Standby mode, press FADER. (2) Press START/STOP. The fade indicator stops flashing and the recording starts fading in.

When Fading out

(1) During recording, press FADER. (2) Press START/STOP. The fade indicator stops flashing and the picture fades out. Then, recording stops.


1
FADER
FADER
M.FADER
2
LOCK
STANDBY

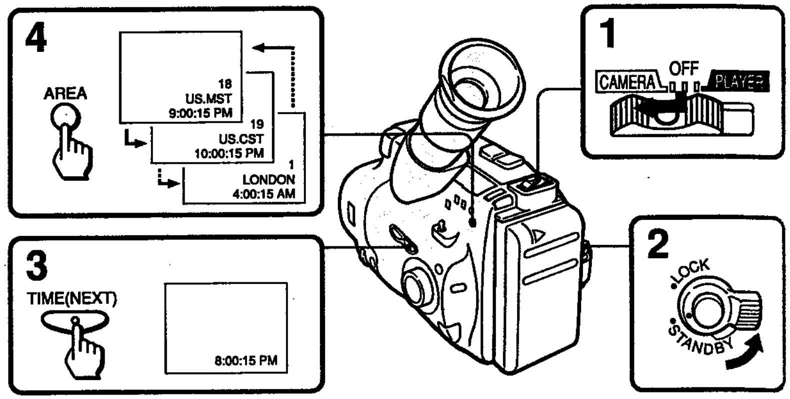
To Cancel the Fade-In/Fade-out Function

Before pressing START/STOP, press FADER until the fade indicator disappears.

Using the World Clock

Before using the world clock, you need to set the date and time in your home area (p. 12). Reset the clock according to the local time zone by pressing AREA. First, find the area name in the "Time Zone Chart" on page 32.

(1) While pressing the small green button on the POWER switch, slide it to CAMERA. (2) Turn the STANDBY switch to STANDBY. (3) Press TIME (NEXT). The setting of time appears. (4) Press AREA to select the area name where you will use the camcorder.

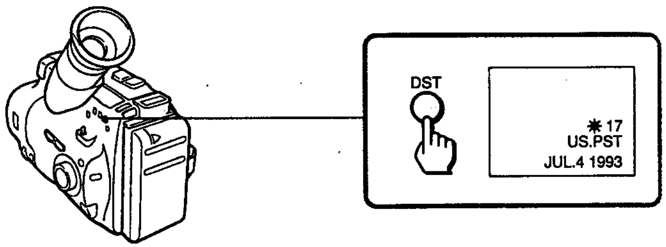

4
AREA
18
US.MST
9:00:15 PM
19
US.CST
10:00:15 PM
1
LONDON
4:00:15 AM
3
TIME(NEXT)
8:00:15 PM
1
CAMERA
OFF
PLAYER
2
LOCK
STANDBY

To Check the Date

Press DATE (+). To turn off the date indicator, press DATE (+) again.

To Adjust to Daylight Savings Time

Press DST. The ✱ indicator appears and the time changes to daylight savings time. To reset to standard time, press DST again.

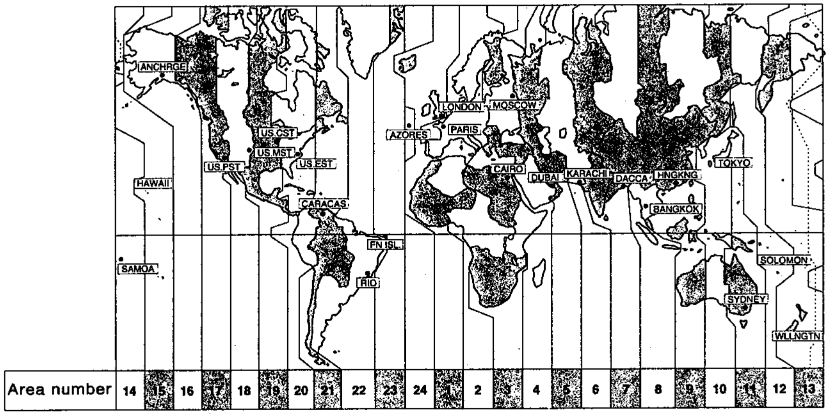

DST
✱17
US.PST
JUL.4 1993

To Reset to Your Home Area Time again

Press AREA until your home area name appears.

Using the World Clock

Time Zone Chart



Area number	Area name	Nations or area*
1	LONDON	England, Morocco, Portugal, GMT (Greenwich Mean Time)
2	PARIS	Austria, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland, CET
3	CAIRO	Egypt, Finland, Greece, Israel, Turkey
4	MOSCOW	Ethiopia, Iraq, Kenya, Mauritius, Saudi Arabia, former Soviet Union (Moscow)
5	DUBAI	United Arab Emirates
6	KARACHI	Maldives, Pakistan
7	DACCA	Bangladesh, India, Myanmar
8	BANGKOK	Cambodia, Indonesia (Jakarta), Thailand, Vietnam
9	HNGKNG	Australia (Perth), China, Hong Kong, Indonesia (Bali, Borneo), Malaysia, Philippines, Singapore, Taiwan
10	TOKYO	Japan, Korea
11	SYDNEY	Australia (Sydney), Guam, Saipan
12	SOLOMON	New Caledonia
13	WLLNGTN	Fiji, New Zealand
14	SAMOA	Western Samoa
15	HAWAII	HST (Hawaii standard time), Tahiti
16	ANCHRGE	AST (Alaska standard time)
17	US. PST	PST (Pacific standard time)
18	US. MST	MST (Mountain standard time)
19	US. CST	CST (Central standard time), Mexico
20	US. EST	EST (East standard time), Canada (Montreal), Jamaica, Peru
21	CARACAS	Chile, Dominica, Venezuela
22	RIO	Argentina, Brazil, Uruguay
23	FN ISL.	Fernando de Noronha
24	AZORES	Azores Islands

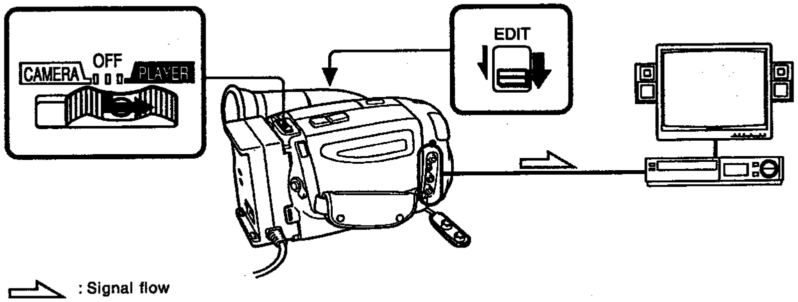
* These are common names. They may be different from formal country names.

Editing onto Another Tape

You can create your own video program by editing with any other 8 mm, Hi8, Betamax, VHS, S-VHS, VHSC or S-VHSC VCR that has audio/video inputs.

Before Editing

Connect the camcorder to the VCR using the supplied A/V connecting cable. (p. 22)
Set the input selector on the VCR to LINE, if available. Set EDIT on the camcorder in the direction of the arrow. Set the POWER switch to PLAYER.



Starting Editing

(1) Insert a blank tape (or a tape you want to record over) into the VCR. And insert your recorded tape into the camcorder. (2) Play back the tape on the camcorder until you locate the point where you want to start editing, then set the camcorder in the playback pause mode. (3) On the VCR, locate the recording start point and set the VCR in the recording pause mode. (4) Press ❙❙ on the camcorder and VCR simultaneously to start editing.

To Edit More Scenes

Repeat steps 2 to 4.

To Stop Editing Momentarily

Press ❙❙ on the VCR.

To Stop Editing

Press □ on both the camcorder and the VCR.

Use of the EDITSEARCH button
You can playback the tape in normal/reverse direction by keep pressing EDITSEARCH during Standby or playback pause mode. You can also playback still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

Note on the EDIT switch
When you set EDIT in the direction of the arrow, you can keep picture deteriorations resulting from editing to a minimum. However, when you edit or copy to another VCR, avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow.

Note on the DATA SCREEN function
If you have displayed the viewfinder screen indicators on the TV, erase the indicators by pressing DATA SCREEN on the Remote Commander so that they will not be superimposed on the edited tape.

Additional Information

Playback Modes

The playback mode (SP or LP) is selected automatically according to the format in which the tape has been recorded. The quality of the recorded picture in LP mode, however, will not be as good as that in SP mode.

Note on AFM Hi-Fi stereo
When you playback a tape, the sound is in monaural if:

- You record the tape using this camcorder, then play it back on an AFM Hi-Fi monaural video recorder/player.
- You record the tape on an AFM Hi-Fi monaural video recorder, then play it back on this camcorder.

LP (long play) mode
When you playback a tape recorded in LP mode, the LP indicator lights up in the viewfinder.
This camcorder cannot record a tape in LP mode.

Foreign 8 mm video
You cannot playback the software recorded on a different TV color system. Because the TV color systems differ from country to country, you may not be able to playback foreign pre-recorded software. Refer to page 39 to check the TV color system of foreign countries.

Maintenance Information and Precautions

Video Head Cleaning

To ensure clear pictures, clean the video heads periodically. When playback pictures are "noisy" or hardly visible, the video heads may be contaminated.

[a] Slight contamination
[b] Critical contamination
If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than 5 times.)

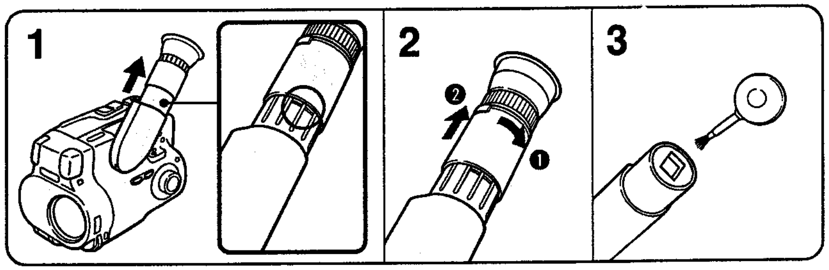
Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

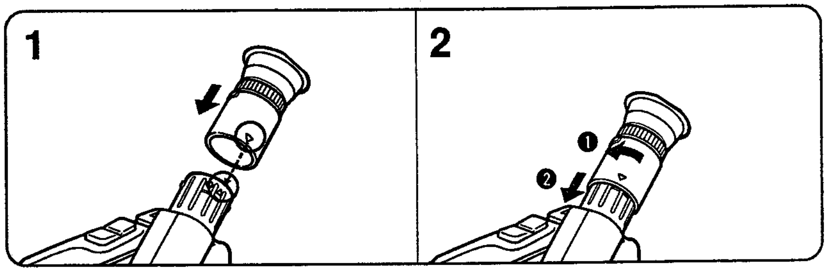
Maintenance Information and Precautions

Removing Dust from Inside the Viewfinder

(1) Pull out the viewfinder barrel until the illustrated mark appears. (2) Turn the viewfinder counterclockwise until it stops, and pull it out. (3) Clean the surface with a commercially available blower.

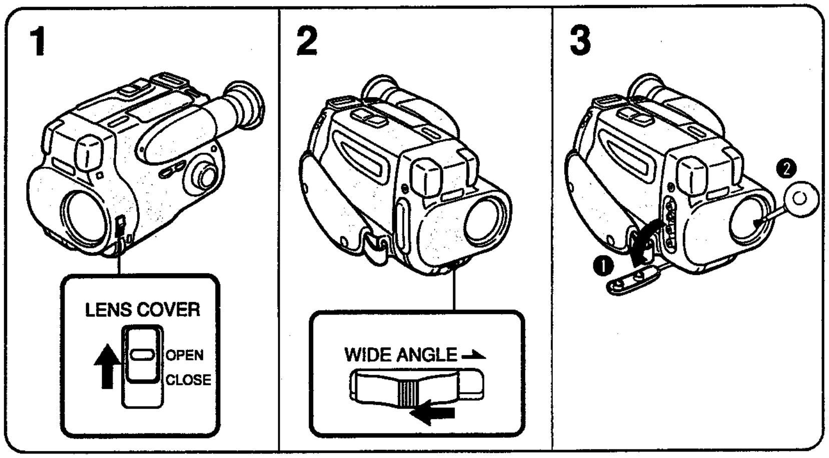


To Reattach the Viewfinder Barrel
(1) Align the mark on the viewfinder barrel with the mark on the viewfinder and push in the viewfinder barrel until it clicks. (2) Turn it clockwise until it stops and push it in.



Removing Dust from Inside the WIDE ANGLE

(1) Slide the LENS COVER switch to OPEN. (2) Slide the WIDE ANGLE switch in the opposite direction of the arrow. (3) Detach the jack cover. Remove the dust by using a blower.



Moisture Condensation

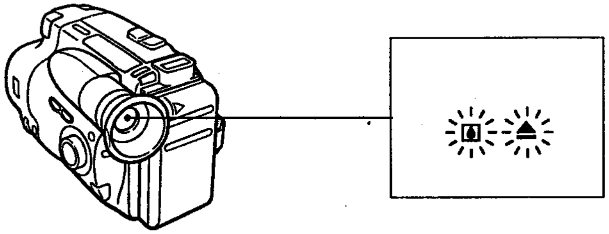
If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

Inside the Camcorder

When the 💧 and ⏏ indicators flash in the viewfinder, moisture has condensed inside the camcorder. If this happens, no other functions except for tape ejection will work.

Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least one hour in a dry place.

The camcorder can be used again if the 💧 indicator does not appear when the power is turned on again.



On the Surface of the Tape

If there is moisture on the surface of the tape, when the cassette is inserted and a tape transport button is pressed, the ⏏ indicator in the viewfinder flashes.

In this case, no other functions except for tape ejection will work. **Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least one hour in a dry place.** The camcorder can be used again if the ⏏ indicator does not appear when you insert the cassette and press one of the tape transport buttons.

On the Lens

If moisture condenses on the lens, no indicator appears, but the picture becomes dim. Turn off the power and do not use the camcorder for about one hour.

How to Prevent Moisture Condensation

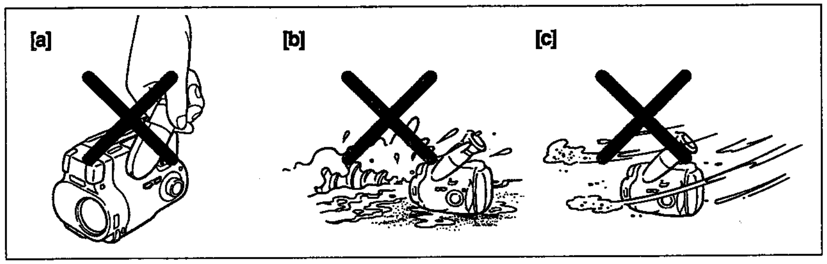
When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

(1) Be sure to tightly seal the plastic bag containing the camcorder.
(2) Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about one hour).

Precautions

Camcorder Operation

- Operate the camcorder on 6.0 V (battery pack) or 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not pick up the camcorder by the viewfinder **[a]**.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the LENS COVER switch set to CLOSE when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired [b].**
- **Do not let the camcorder get wet. Keep the camcorder away from rain or sea water. It may cause the unit to malfunction and sometimes the malfunction cannot be repaired [c].**



Maintenance Information and Precautions

On Handling Tapes

Do not insert anything in the small holes on the rear of the cassette. These holes are used to sense the type, thickness of tape, or if the tab is out or in, etc.

Camcorder Care

- When the camcorder is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

AC Power Adaptor

Charging

- **Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you use the battery completely and charge it fully again.**
- Charge the battery on a flat place without vibration.
- The battery will get hot during charging. But this is normal.

Do not continuously recharge a charged battery pack as that will cause the battery pack efficiency to deteriorate.

Charging temperature

The temperature range for charging is 5°C to 35°C (41°F to 95°F). However, to provide maximum battery efficiency, the recommended temperature range when charging is 10°C to 30°C (50°F to 86°F).

Others

- The model for USA or Canada: One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Unplug the unit from the wall outlet when not in use for a long time. To disconnect the cord (mains lead), pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if it has been dropped or damaged.
- Do not bend the AC power cord forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or an electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If it does, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- While the unit is in use, it gets hot. But this is normal.
- Do not place the unit in locations where it is;
  - Extremely hot or cold
  - Dusty or dirty
  - Very humid
  - Vibrating

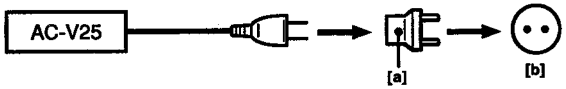
If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

Using Your Camcorder Abroad

Each country has its own electricity and TV color system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.
Use a commercially available AC plug adaptor **[a]**, if necessary, depending on the design of the wall outlet **[b]**.



To View the Playback Picture

This camcorder is an NTSC system based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV or a PAL-M system based TV with an NTSC/PAL-M transcoder.
Check the following list.

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

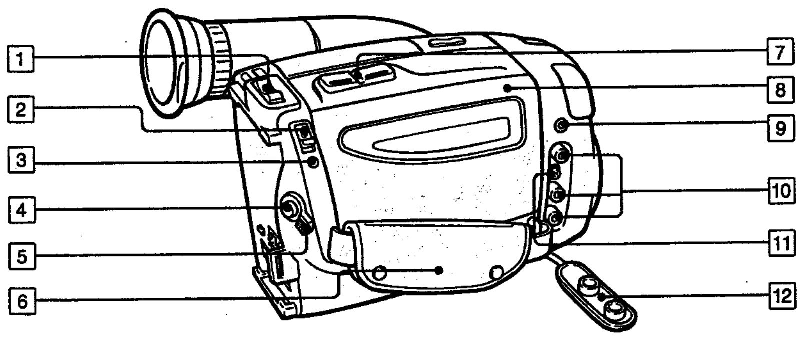
PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, former West Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

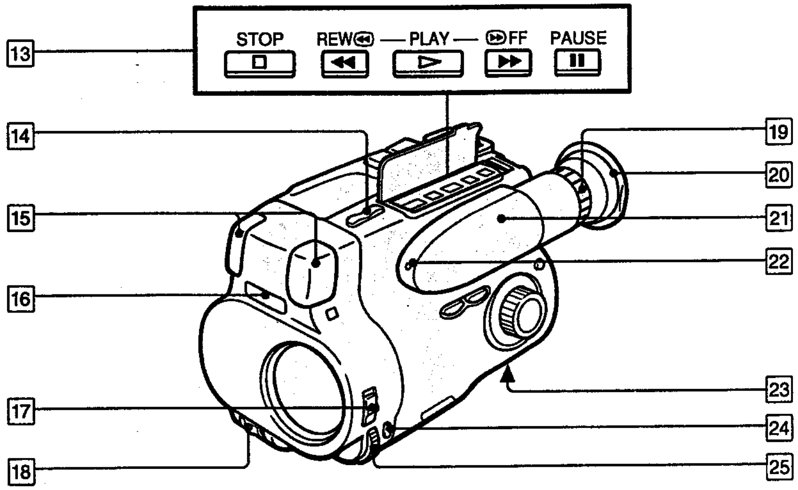
PAL-M system country
Brazil

PAL-N system countries
Argentina, Paraguay, Uruguay

SECAM system countries
Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

Identifying the Parts





1 **POWER switch** (p. 16, 23)
CAMERA: for camera recording
PLAYER: for playing back or editing a tape
OFF: power off

2 **EJECT knob** (p. 13)
Slide it to insert a cassette into the cassette holder or to eject the cassette.

3 **REMOTE Ⓛ (LANC) control jack**
Connect the LANC Ⓛ connecting cable to a wired remote control unit such as an editing controller. In this case, set the REMOTE COMMANDER switch to OFF.
Ⓛ stands for Local Application Control Bus System. The Ⓛ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.

4 **START/STOP button** (p. 16)
To start recording, press it after setting the POWER switch to CAMERA and turn the STANDBY switch to STANDBY. To stop recording momentarily, press it again.

5 **STANDBY switch** (p. 16)
STANDBY: To set the camcorder to recording standby mode.
LOCK: To stop recording or to prevent from accidentally recording and wearing down the battery.

6 **Grip strap** (p. 15)
Put your hand through the grip strap to hold the camcorder. Adjust the length of the strap so that your thumb can easily touch START/STOP.

7 **Power zoom button** (p. 18)
Press it to change the size of the subject in the scene.
T side: for telephoto (subject appears closer)
W side: for wide-angle (subject appears further away)

8 **Cassette holder** (p. 13)
When you slide the EJECT knob, this holder lifts up and opens automatically.

9 **MIC jack (PLUG IN POWER)**
Connect an optional external microphone (stereo or monaural). This jack also accepts a "plug-in-power" microphone.

10 **Audio/Video output jacks** (p. 22)
To view the recorded picture on the TV or to rerecord onto another tape, connect these jacks and the Audio/Video input jacks on the TV or VCR using the supplied A/V connecting cable.

11 **RFU DC OUT (RFU adaptor DC output) jack** (p. 22)
To view the recorded picture on a TV that has only an antenna input, connect the RFU adaptor here.

12 **Jack cover**

13 **Tape transport buttons** (p. 23)
☐ STOP
◀◀ REW (rewind)
▷PLAY (playback)
▶▶ FF (fastforward)
❚❚ PAUSE

14 **EDITSEARCH button** (p. 21)
Press it to check the recorded scene in the viewfinder in Standby mode.
+ side: to view the forward playback picture
– side: to view the reverse playback picture

15 **Built-in microphone (stereo)**

16 **Remote sensor** (p. 44)
Aim the Remote Commander here for remote control.

17 **LENS COVER switch**
Before recording, slide it to OPEN. When you finish recording, slide it to CLOSE to protect the lens.

18 **WIDE ANGLE switch**
Slide it in the direction of the arrow to get the wide-angle picture.

19 **Viewfinder lens adjustment ring** (p. 14)
To focus the viewfinder lens, turn this ring until the indicator in the viewfinder comes into sharp focus.

20 **Eyecup**
To achieve better camera recording, place your eye firmly against it. If you wear glasses, bend it back to get a better view of the viewfinder.

21 **Viewfinder** (p. 14, 21)
You can monitor the monochrome picture being recorded or played back. For details on the indicators in the viewfinder, see page 50.

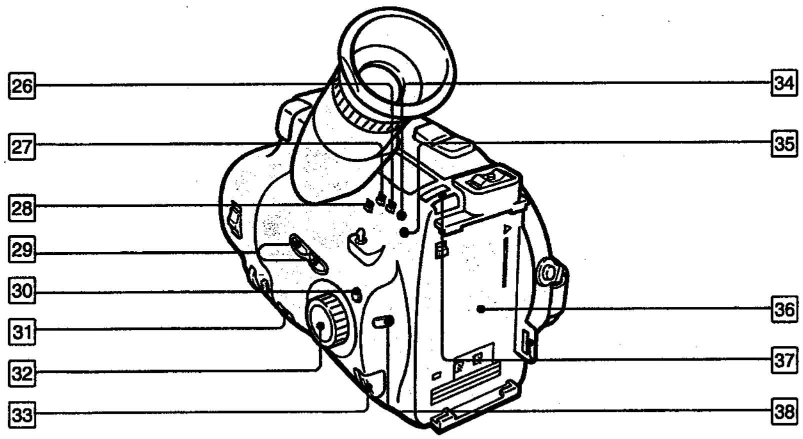
22 **Camera recording/battery lamp**
This red lamp lights up during camera recording. When it flashes, the battery is dead.

23 **Tripod receptacle** (p. 15)
Attach a tripod (not supplied) here.
When attaching a non-SONY tripod, make sure that the length of the camera mounting screw is shorter than 6.5 mm (9/32 inches). Otherwise, the screw might damage the internal components of the camcorder.

24 **FOCUS button** (p. 27)
Press it to set the camcorder in manual focus.

25 **Focus dial** (p. 27)
Turn it to adjust the focus manually and to achieve a sharp focus in manual focus.

Identifying the Parts



26 **EDIT switch** (p. 33)
To edit the recorded picture onto another tape on VCR, set this switch in the direction of the arrow.

27 **REMOTE COMMANDER switch** (p. 43)
To use the Remote Commander, set this switch to ON.

28 **BEEP switch** (p. 14)
To hear the beep sound, set this switch to ON.

29 **DATE (+) and TIME (NEXT) buttons** (p. 12)
Press them to set the clock or to display or turn off the date and time in the viewfinder. When setting the date and time, press DATE (+) button to advance numbers and press TIME (NEXT) button to set the next factor.

30 **FADER button**
When fading-in, press this switch during Standby mode and then press START/STOP. When fading out, press this switch during recording and then press START/STOP.

31 **Lithium battery compartment (bottom of the Camcorder)** (p. 10)
Insert a lithium battery here to activate the clock.

32 **PROGRAM AE dial** (p. 29)
Set it to select from four PROGRAM AE modes (Portrait/Sports/High-Speed Shutter/Twilight mode) to fit the shooting situation.

33 **BATT (battery eject) knob** (p. 7)
While pressing this knob, eject the battery pack.

34 **DST (Daylight Saving Time) button** (p. 12, 31)
Press it to change the time to daylight saving time. To reset to standard time, press it again.

35 **AREA button**
Press it to reset the clock according to the required time zone.

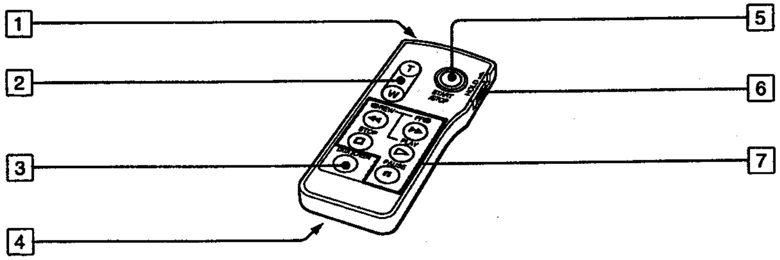
36 **Battery mounting surface** (p. 7)

37 **Hooks for shoulder strap** (p. 44)

38 **COUNTER RESET button** (p. 17)
Press it to reset the tape counter to zero.

Remote Commander

The buttons that have the same name on the Remote Commander and on the camcorder function identically.



1 **Transmitter**
Point toward the remote sensor to control the camcorder after turning on the POWER switch on the camcorder.

2 **Power zoom button**
The zooming speed is unchangeable in the Remote Commander.

3 **DATA SCREEN**
Press to display the viewfinder screen indicators on the TV when you connect the camcorder to a TV. To erase the indicators, press again.

4 **Lithium battery holder** (p. 11)

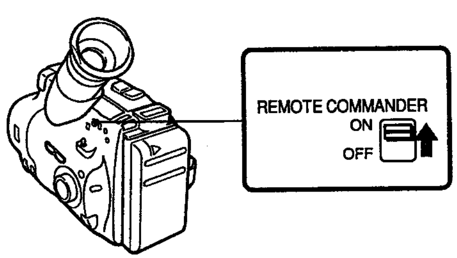
5 **START/STOP button**

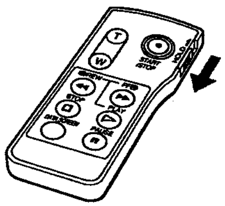
6 **HOLD Switch**
Slide it in the direction of the arrow to prevent any misoperation. Before using this Remote Commander, slide it in the opposite direction of the arrow.

7 **Tape transport buttons**

Using the Remote Commander

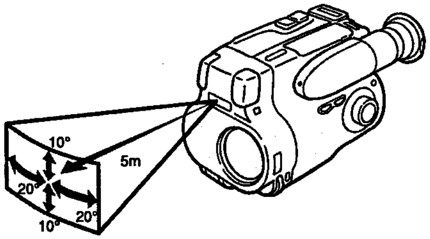
Make sure that the REMOTE COMMANDER switch on the camcorder is set to ON and that the HOLD switch on the Remote Commander is not working.





Identifying the Parts

Remote Control Direction

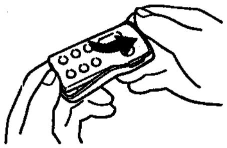


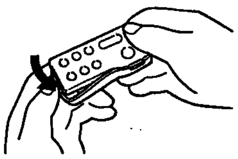
Note on the Remote Commander

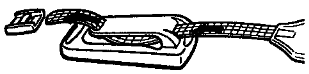
- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- This camcorder works at commander mode VTR 2. The commander modes (1, 2 and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

Using the Remote Commander Holder

You can clip the Remote Commander holder on your coat pocket or belt, or slide it onto the shoulder strap before attaching the Remote Commander to it.

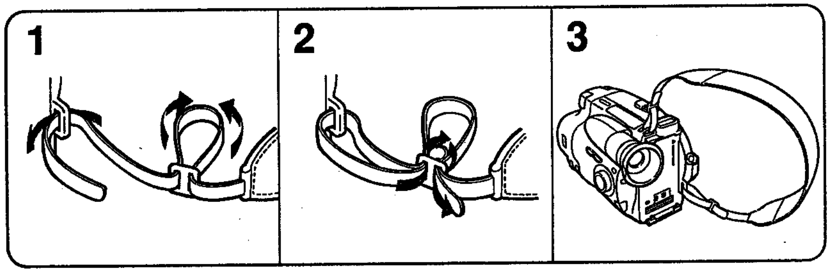






Attaching the Shoulder Strap

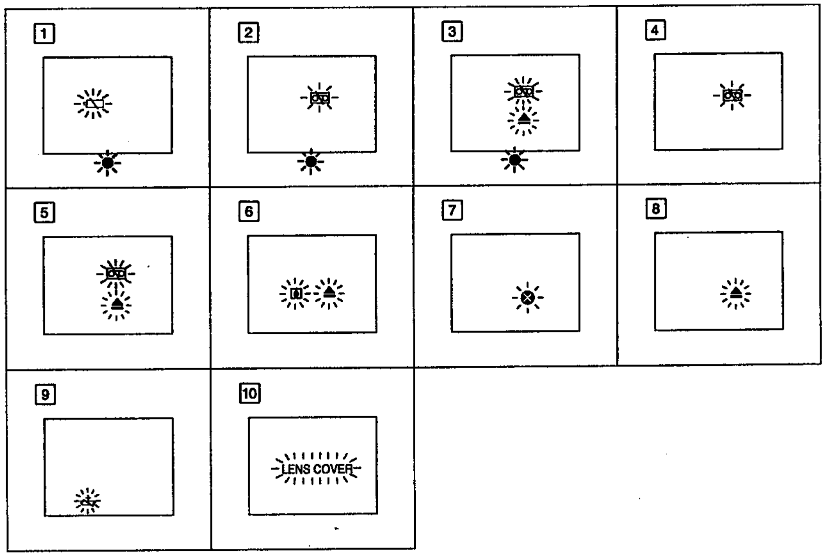
Attach the supplied shoulder strap to the hooks for the shoulder strap (p. 42).



Indicators in the Viewfinder

Warning Indicators

If indicators flash in the viewfinder or a caution lamp on the camcorder flashes, check the following:



1 The battery is weak or dead.
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.

2 The tape is near the end.
The flashing is slow.

3 The tape has run out.
The flashing becomes rapid.

4 No tape has been inserted.

5 The tab on the tape is out (red).

6 Moisture condensation has occurred. (p. 36)

7 The video heads may be contaminated. (p. 34)

8 Some other trouble has occurred.
Disconnect the power source and contact your Sony dealer or local authorized facility.

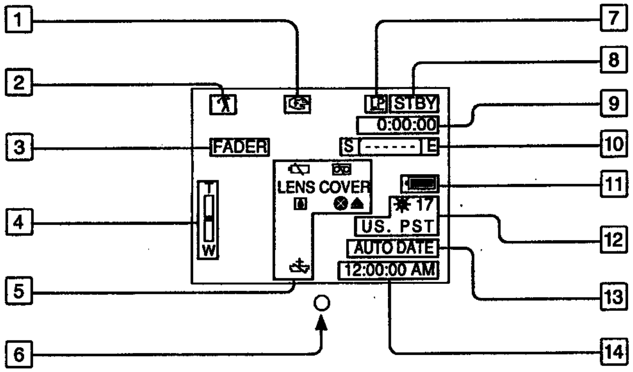
9 The lithium battery is weak or is not installed. (p. 11)

10 The LENS COVER switch is set to CLOSE.

Indicators in the Viewfinder

Operation Indicators

For details on each indicator, refer to the pages indicated in the parenthesis.



1
2
3
4
5
6
FADER
LP
STBY
0:00:00
S
E
LENS COVER
T
W
17
US. PST
AUTO DATE
12:00:00 AM
7
8
9
10
11
12
13
14

1 Manual focusing (p. 27)

2 PROGRAM AE indicator (p. 28)

3 FADER indicator (p. 30)

4 Power zoom indicator (p. 18)

5 Warning indicators (p. 49)

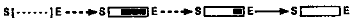
6 Recording lamp/Battery lamp

7 Lights up when playing back a tape recorded in LP mode

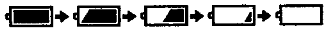
8 Tape transport mode (p. 16, 23)

9 Tape counter (p. 17)

10 Remaining tape length indicator



11 Remaining battery indicator (p. 8)



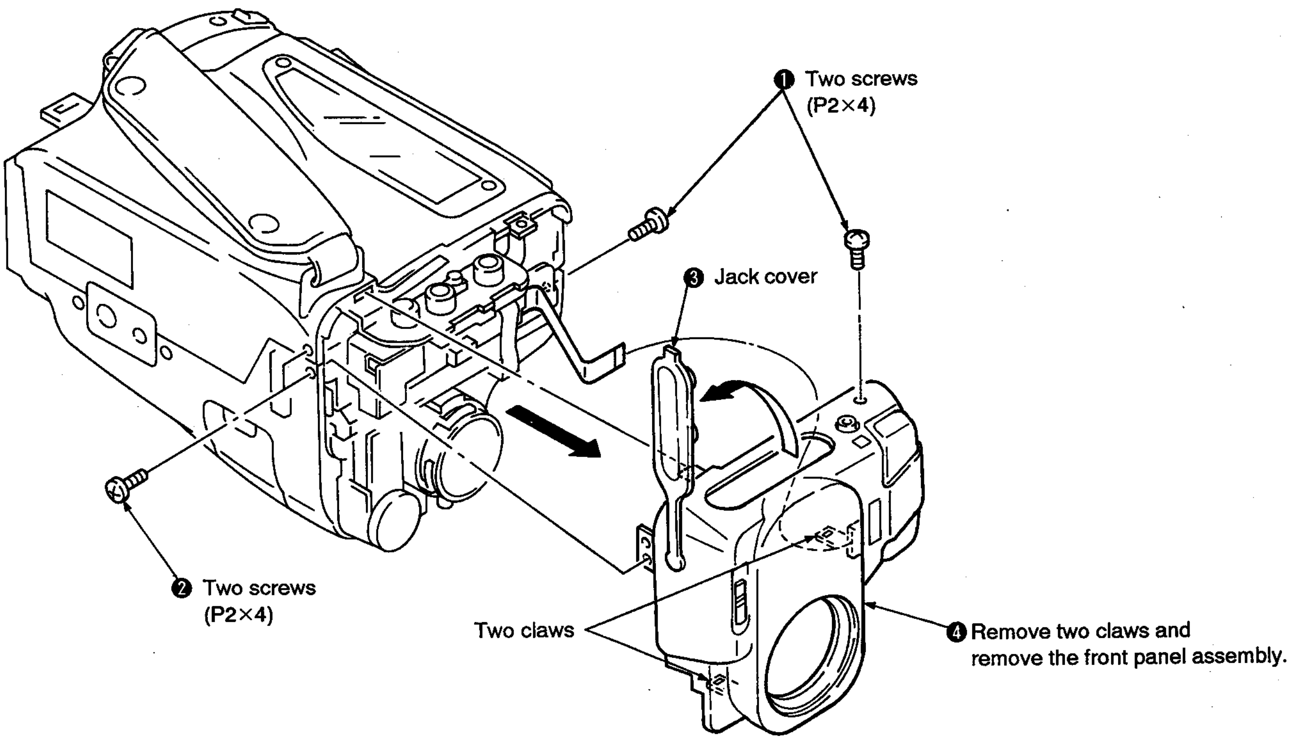
12 World clock indicator (p. 31)

13 AUTO DATE indicator (p. 16)

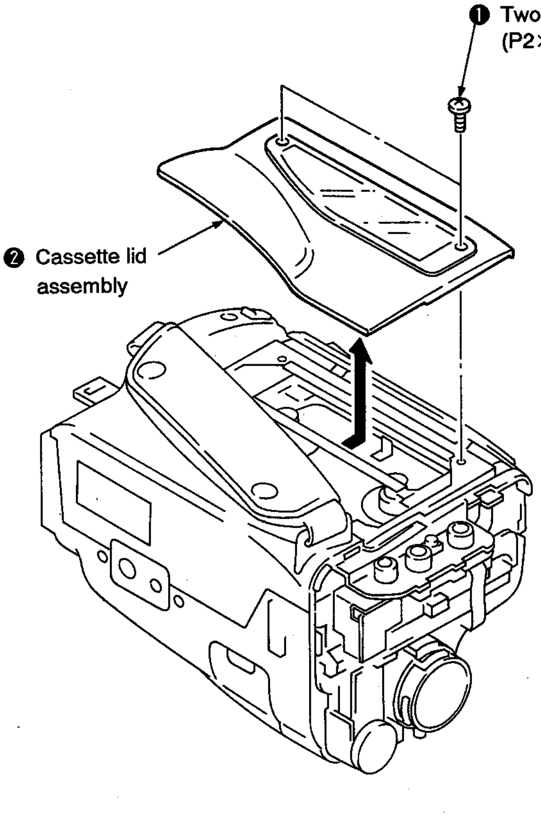
14 Date or Time (p. 12)

SECTION 2
DISASSEMBLY

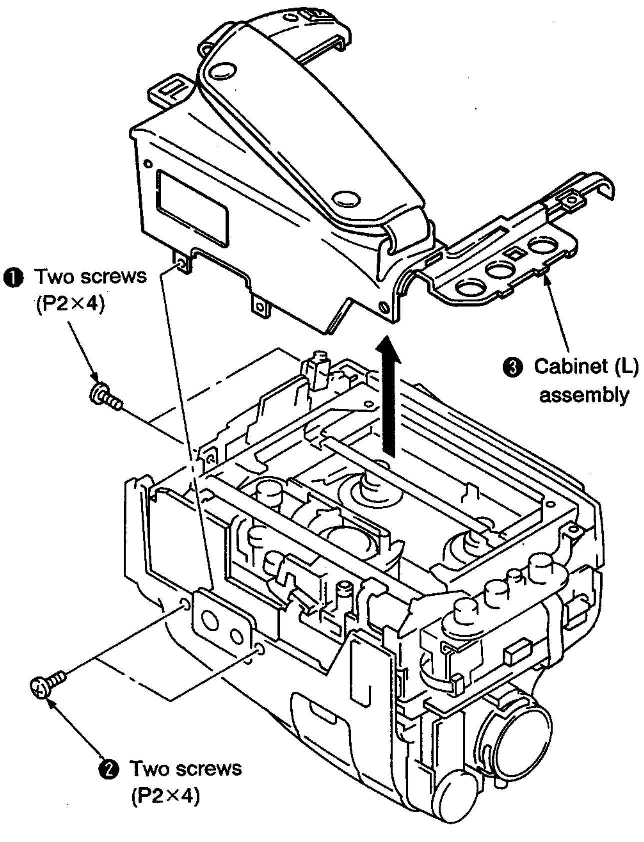
2-1. REMOVAL OF F PANEL ASSEMBLY


❶ Two screws
(P2×4)
❸ Jack cover
❷ Two screws
(P2×4)
Two claws
❹ Remove two claws and
remove the front panel assembly.

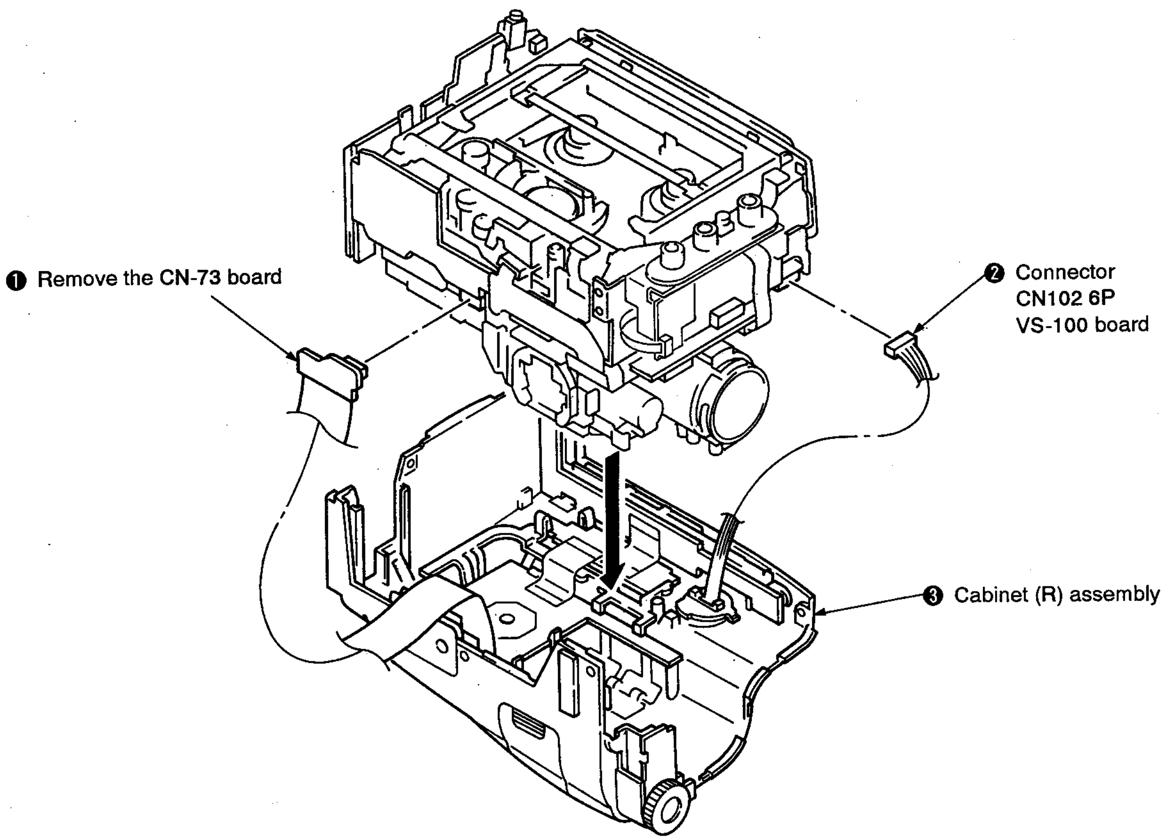
2-2. REMOVAL OF CASSETTE LID ASSEMBLY


❶ Two screws
(P2×4)
❷ Cassette lid
assembly

2-3. REMOVAL OF CABINET (L) ASSEMBLY

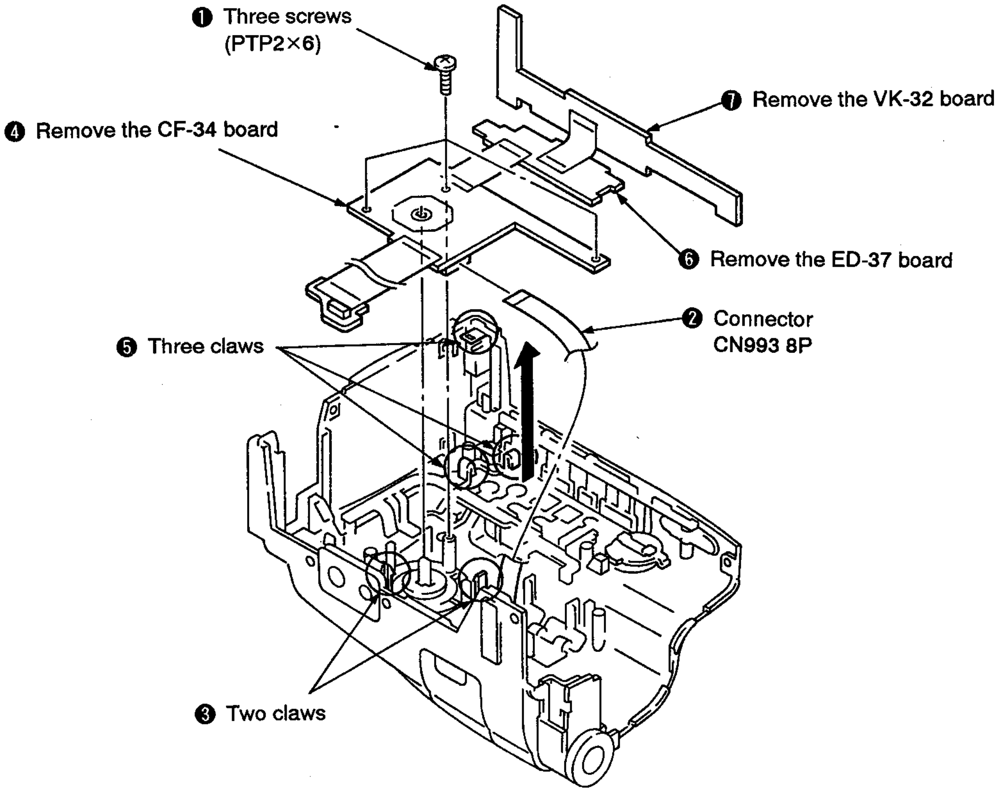

❶ Two screws
(P2×4)
❸ Cabinet (L)
assembly
❷ Two screws
(P2×4)

2-4. REMOVAL OF CABINET (R) ASSEMBLY



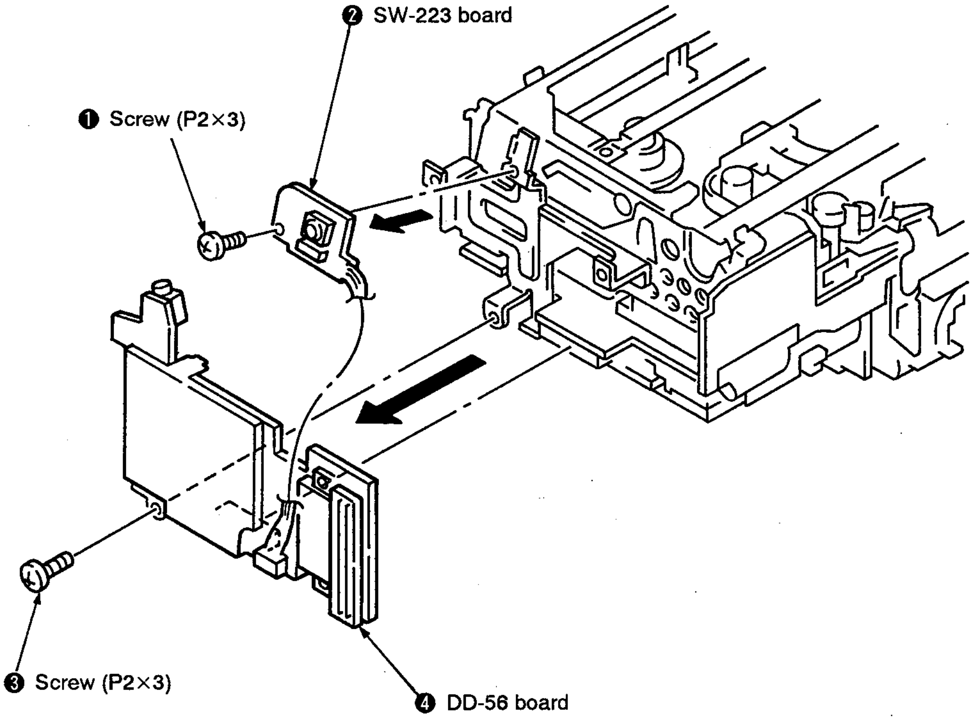
❶ Remove the CN-73 board
❷ Connector
CN102 6P
VS-100 board
❸ Cabinet (R) assembly

2-5. REMOVAL OF CF-34, ED-37 AND VK-32 BOARDS

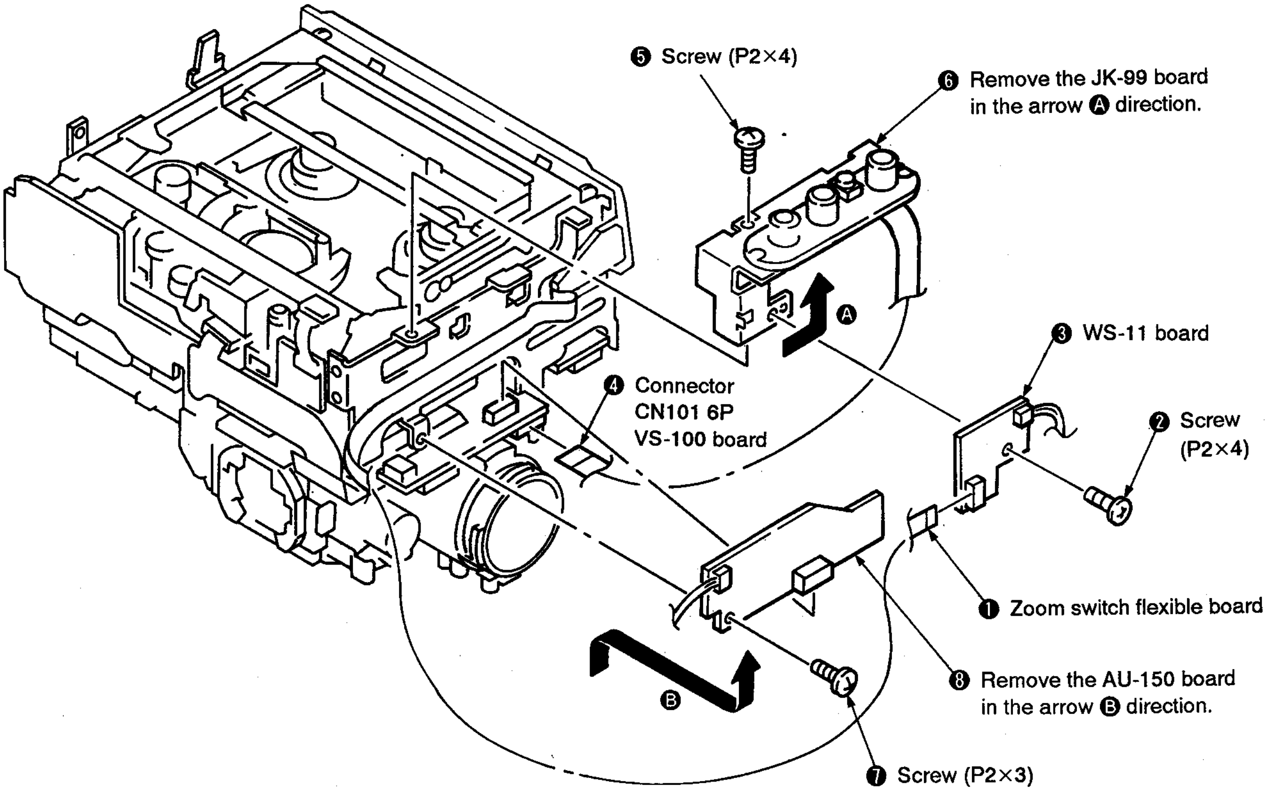


❶ Three screws
(PTP2×6)
❼ Remove the VK-32 board
❹ Remove the CF-34 board
❻ Remove the ED-37 board
❷ Connector
CN993 8P
❺ Three claws
❸ Two claws

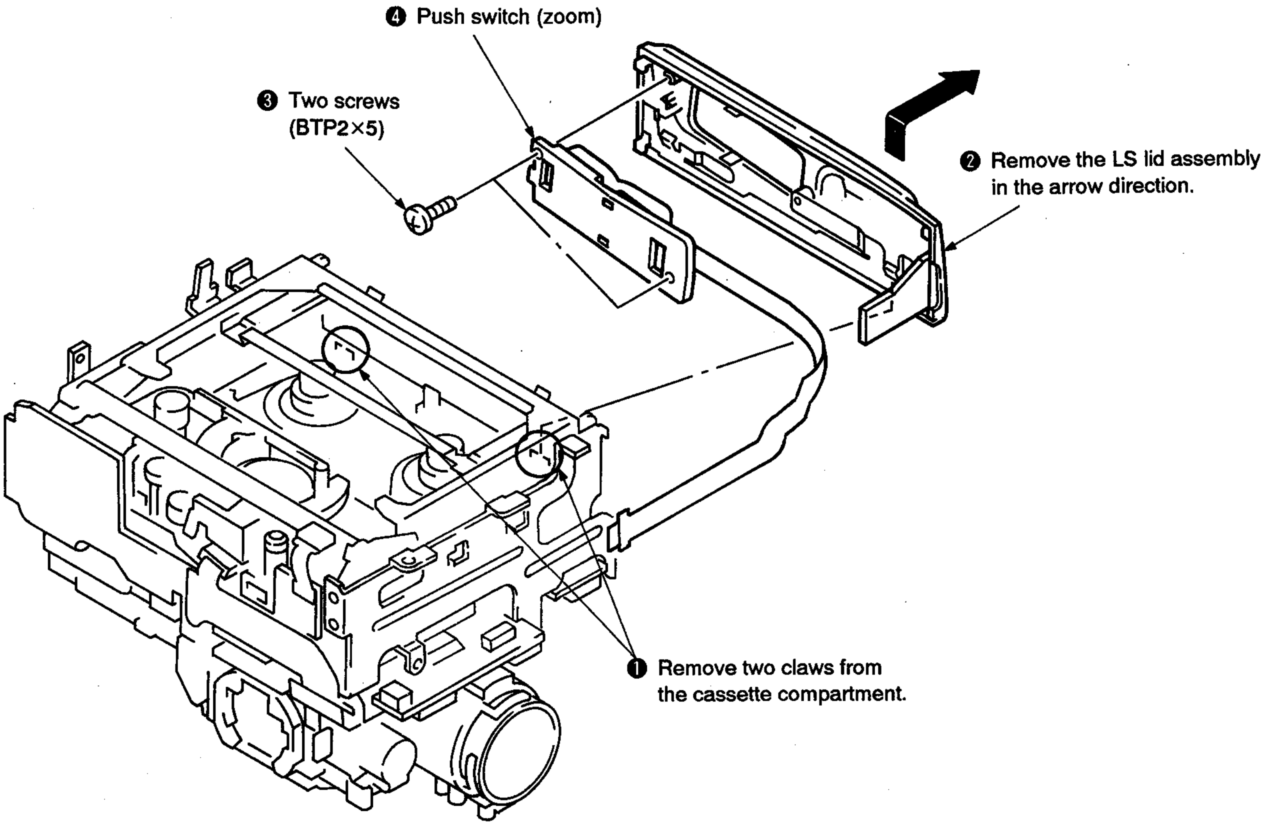
2-6. REMOVAL OF DD-56 AND SW-223 BOARDS


② SW-223 board
① Screw (P2×3)
③ Screw (P2×3)
④ DD-56 board

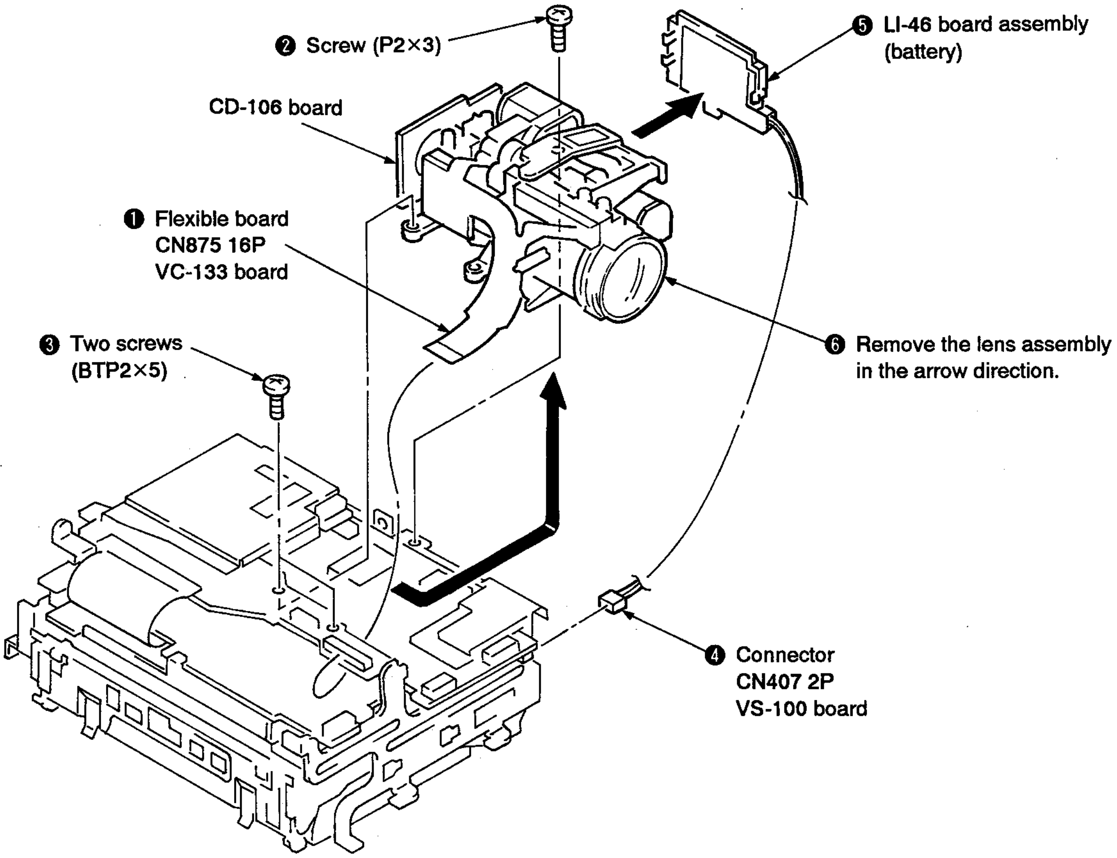
2-7. REMOVAL OF JK-99, AU-150 AND WS-11 BOARDS


⑤ Screw (P2×4)
⑥ Remove the JK-99 board in the arrow Ⓐ direction.
Ⓐ
③ WS-11 board
④ Connector CN101 6P VS-100 board
② Screw (P2×4)
① Zoom switch flexible board
Ⓑ
⑧ Remove the AU-150 board in the arrow Ⓑ direction.
⑦ Screw (P2×3)

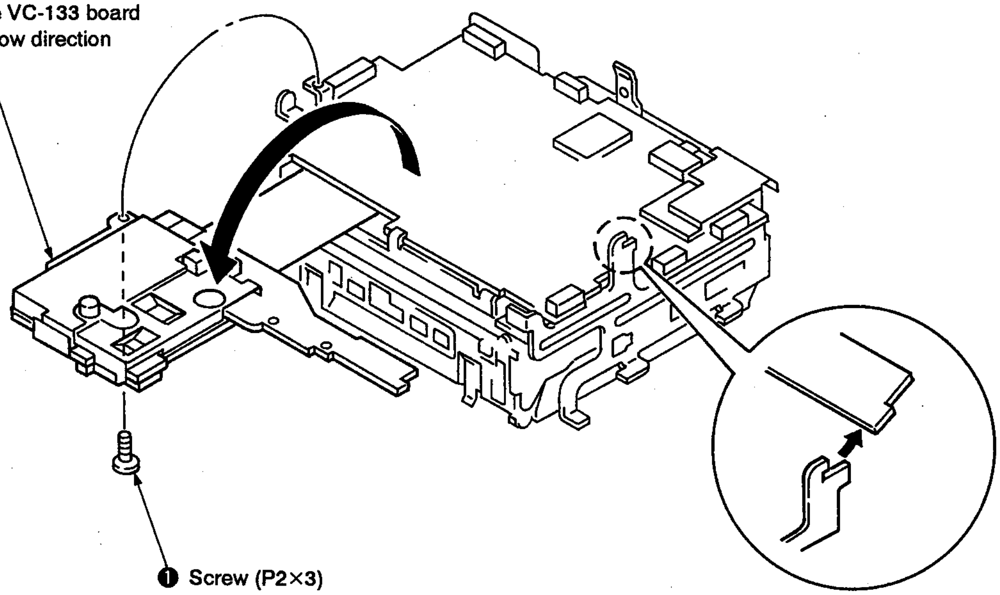
2-8. REMOVAL OF LS LID ASSEMBLY


❹ Push switch (zoom)
❸ Two screws (BTP2×5)
❷ Remove the LS lid assembly in the arrow direction.
❶ Remove two claws from the cassette compartment.

2-9. REMOVAL OF LENS ASSEMBLY (CD-106 BOARD)


❷ Screw (P2×3)
❺ LI-46 board assembly (battery)
CD-106 board
❶ Flexible board CN875 16P VC-133 board
❻ Remove the lens assembly in the arrow direction.
❸ Two screws (BTP2×5)
❹ Connector CN407 2P VS-100 board

2-10. OPENING OF VC-133 BOARD

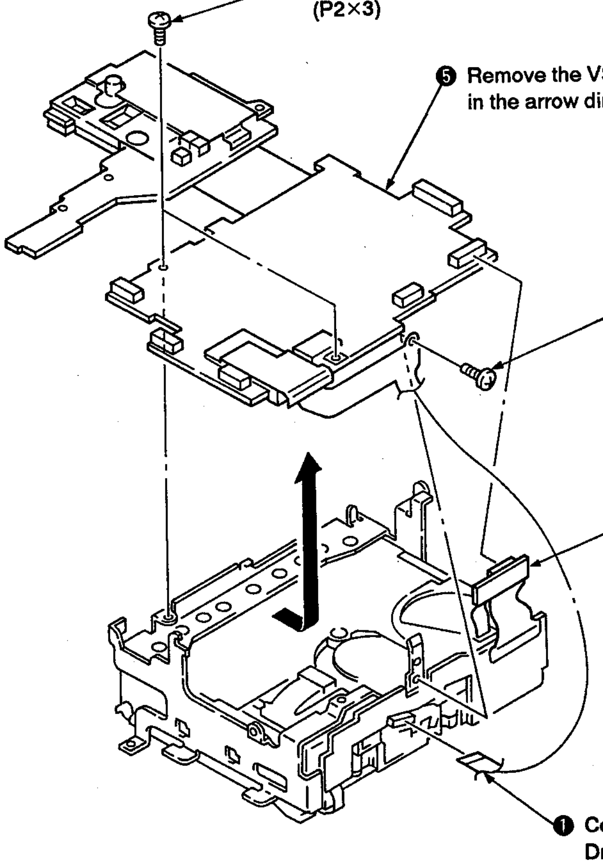


❸ Open the VC-133 board in the arrow direction

❶ Screw (P2×3)

❷ Remove the VC-133 board by removing claw of frame (Lower)

2-11. REMOVAL OF VS-100 BOARD



❹ Two screws (P2×3)

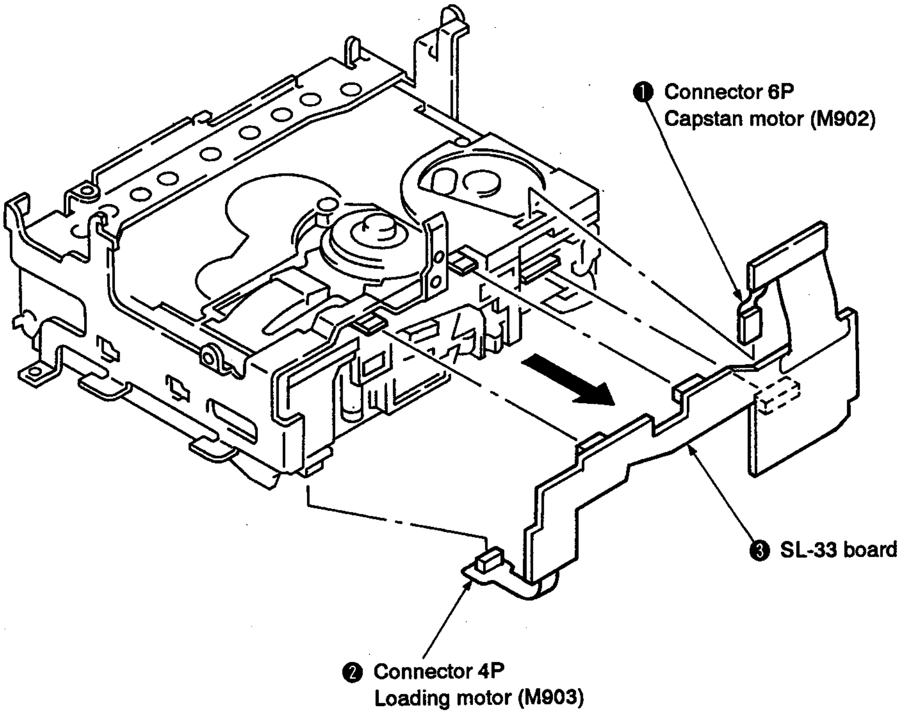
❺ Remove the VS-100 board in the arrow direction

❸ Screw (P2×3)

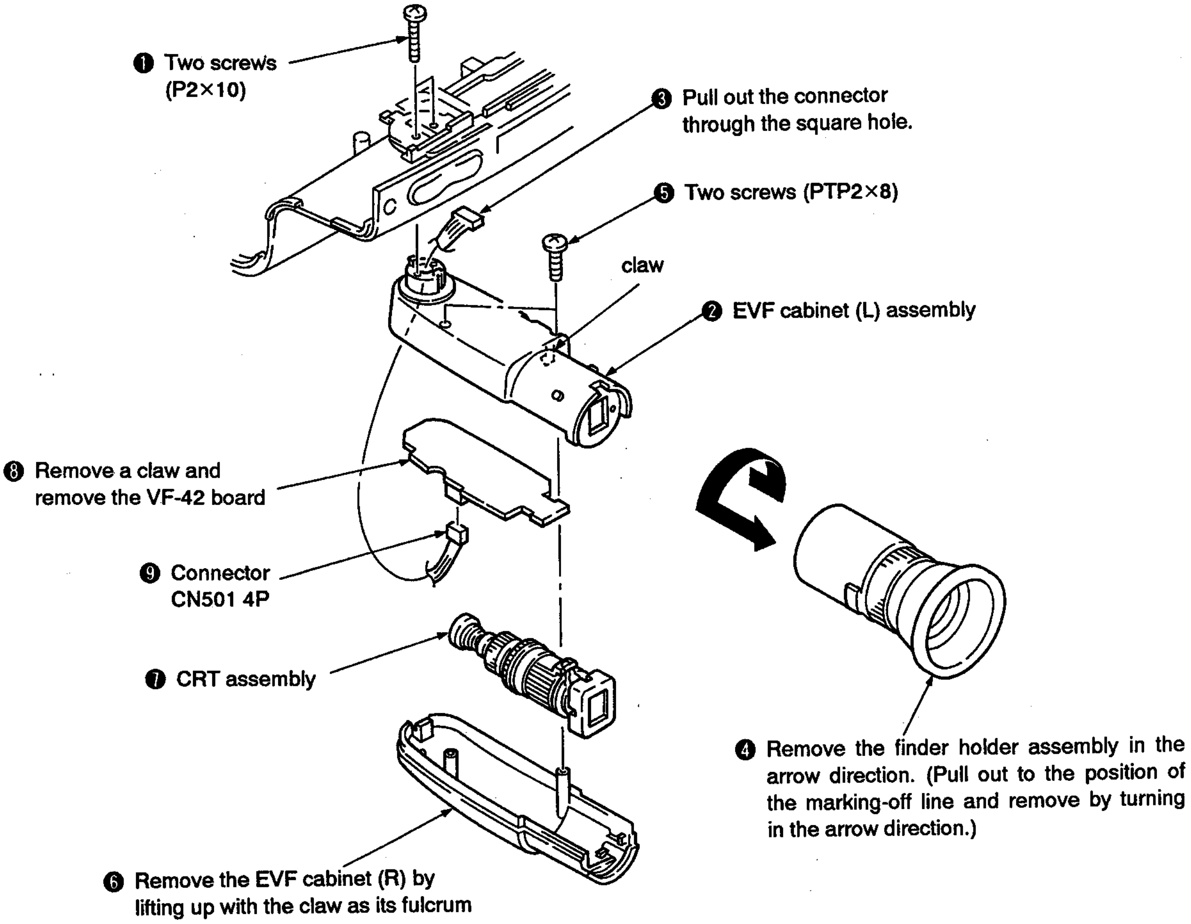
❷ Connector CN406 30P

❶ Connector 11P Drum motor (M901)

2-12. REMOVAL OF SL-33 BOARD

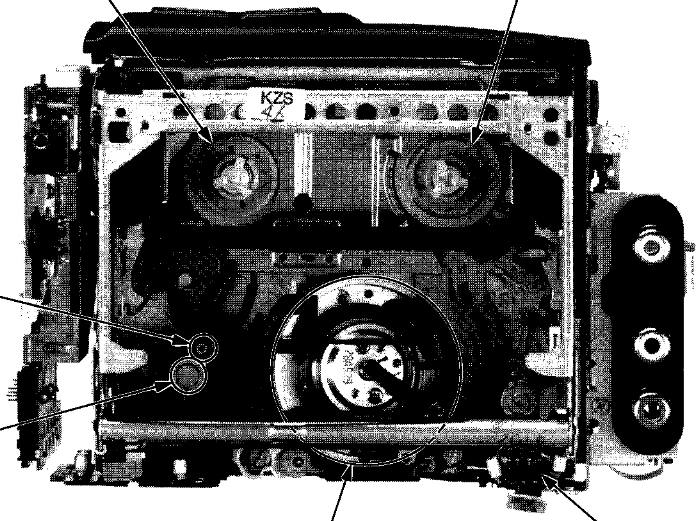

❶ Connector 6P
Capstan motor (M902)
❸ SL-33 board
❷ Connector 4P
Loading motor (M903)

2-13. REMOVAL OF EVF ASSEMBLY (VF-42 BOARD)


❶ Two screws
(P2×10)
❸ Pull out the connector
through the square hole.
❺ Two screws (PTP2×8)
claw
❷ EVF cabinet (L) assembly
❽ Remove a claw and
remove the VF-42 board
❾ Connector
CN501 4P
❼ CRT assembly
❹ Remove the finder holder assembly in the arrow direction. (Pull out to the position of the marking-off line and remove by turning in the arrow direction.)
❻ Remove the EVF cabinet (R) by
lifting up with the claw as its fulcrum

2-14. INTERNAL VIEWS

— Left side —



T reel table assembly
X-3941-274-1

S reel table assembly
X-3941-275-6

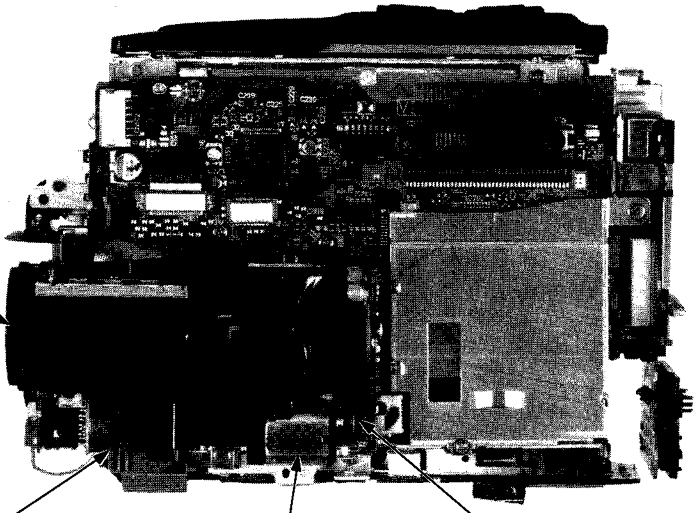
Pinch roller

M902
Capstan motor (SCE-0101A)
8-835-477-01

M901
Drum assembly (DGH-78A-R)
A-7048-564-A
Upper drum assembly (DGR-78-R)
A-7049-501-A

M903
Loading motor assembly
A-7040-304-A

— Right side —



Zoom lens (VCL-6210WC)
1-547-548-11

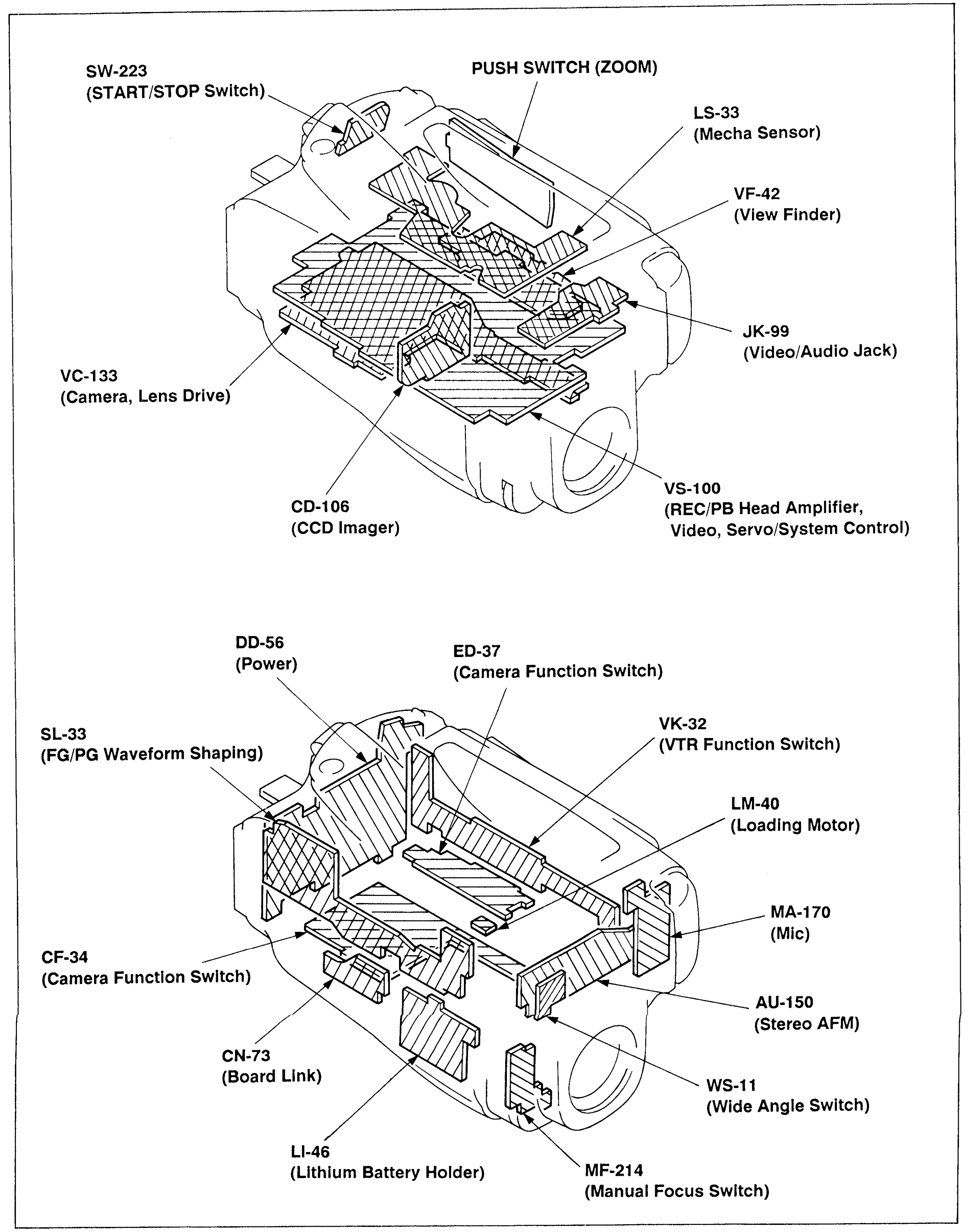
M904
IRIS meter assembly
3-708-494-01

M906
Zoom motor assembly
3-708-492-01

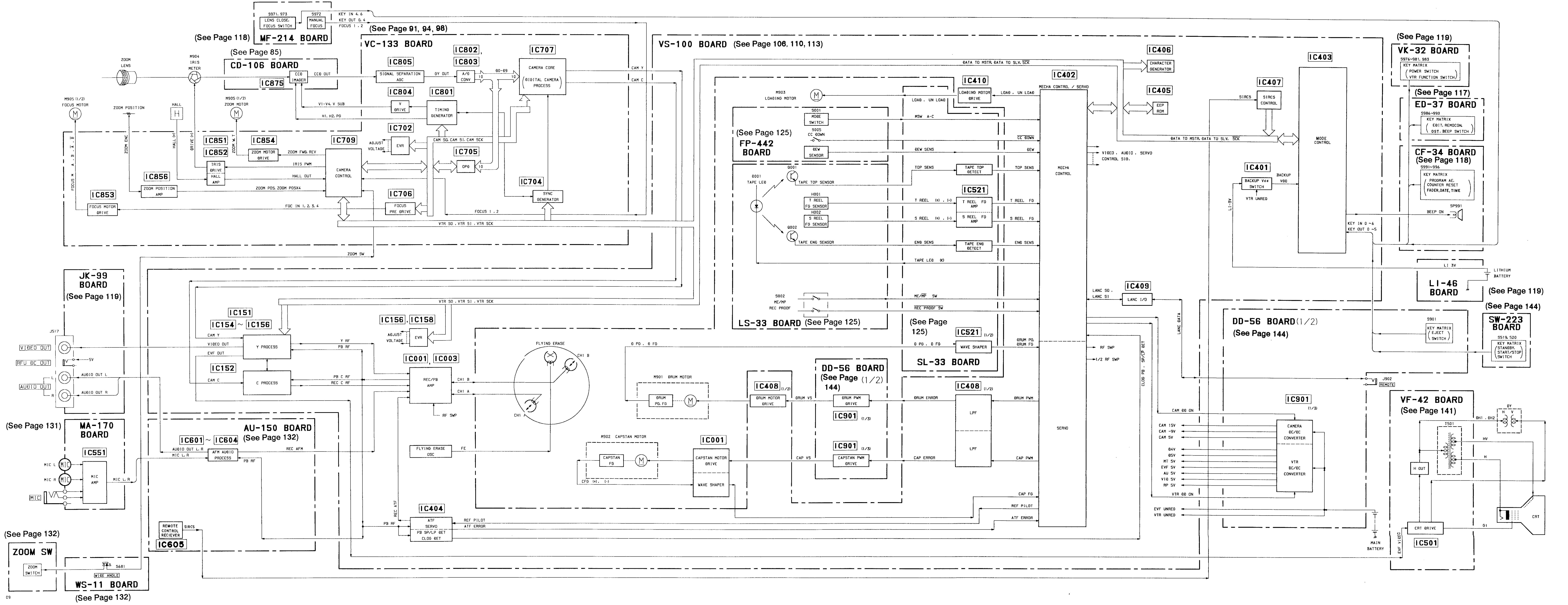
M905
Focus motor assembly
3-708-491-01

SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION


SW-223
(START/STOP Switch)
PUSH SWITCH (ZOOM)
LS-33
(Mecha Sensor)
VF-42
(View Finder)
JK-99
(Video/Audio Jack)
VC-133
(Camera, Lens Drive)
CD-106
(CCD Imager)
VS-100
(REC/PB Head Amplifier,
Video, Servo/System Control)
DD-56
(Power)
ED-37
(Camera Function Switch)
SL-33
(FG/PG Waveform Shaping)
VK-32
(VTR Function Switch)
LM-40
(Loading Motor)
MA-170
(Mic)
CF-34
(Camera Function Switch)
AU-150
(Stereo AFM)
CN-73
(Board Link)
WS-11
(Wide Angle Switch)
LI-46
(Lithium Battery Holder)
MF-214
(Manual Focus Switch)

3-2. OVERALL BLOCK DIAGRAM


(See Page 118) MF-214 BOARD
S971, 973 LENS CLOSE, FOCUS SWITCH
S972 MANUAL FOCUS
KEY IN 4, 6
KEY OUT 0, 4
FOCUS 1, 2
(See Page 85) CD-106 BOARD
IC875 CCD IMAGER
CCD OUT
ZOOM LENS
M904 IRIS METER
M905 (1/2) FOCUS MOTOR
ZOOM POSITION
HALL
M905 (1/2) ZOOM MOTOR
(See Page 91, 94, 98) VC-133 BOARD
IC805 SIGNAL SEPARATION AGC
GY OUT
IC802, IC803 A/D CONV
D0-D9
IC707 CAMERA CORE (DIGITAL CAMERA PROCESS)
CAM Y
CAM C
IC804 V DRIVE
IC801 TIMING GENERATOR
V1-V4, V SUB
H1, H2, PG
IC702 EVR
ADJUST VOLTAGE
CAM SO, CAM SI, CAM SCK
IC705 OPD
IC704 SYNC GENERATOR
IC709 CAMERA CONTROL
IC851 IC852 IRIS DRIVE HALL AMP
IC854 ZOOM MOTOR DRIVE
ZOOM FWD, REV
IRIS PWM
HALL OUT
IC856 ZOOM POSITION AMP
ZOOM POS, ZOOM POSX4
IC853 FOCUS MOTOR DRIVE
FOC IN 1, 2, 3, 4
IC706 FOCUS PRE DRIVE
FOCUS 1, 2
FOCUS M A, B, A, B
ZOOM ENC
HALL (+)
DRIVE (+)
ZOOM W, T
VTR SO, VTR SI, VTR SCK
ZOOM SW
JK-99 BOARD (See Page 119)
J517
VIDEO OUT
RFU DC OUT
5V
AUDIO OUT L
AUDIO OUT R
AUDIO OUT
IC151 IC154 ~ IC156 Y PROCESS
CAM Y
VIDEO OUT
EVF OUT
Y RF
PB RF
IC152 C PROCESS
CAM C
PB C RF
REC C RF
IC156, IC158 EVR
ADJUST VOLTAGE
IC001, IC003 REC/PB AMP
CH1 B
CH1 A
RF SWP
FLYING ERASE
FLYING ERASE OSC
FE
(See Page 131) MA-170 BOARD
IC551 MIC AMP
MIC L
MIC R
MIC
MIC L, R
AU-150 BOARD (See Page 132)
IC601 ~ IC604 AFM AUDIO PROCESS
AUDIO OUT L, R
MIC L, R
REC AFM
PB RF
REMOTE CONTROL RECIEVER
SIRCS
IC605
REC ATF
IC404 ATF SERVO PB SP/LP DET CLOG DET
REF PILOT
ATF ERROR
(See Page 132) ZOOM SW
ZOOM SWITCH
S681
WIDE ANGLE
WS-11 BOARD
(See Page 132)
VS-100 BOARD (See Page 106, 110, 113)
DATA TO MSTR, DATA TO SLV, SCK
IC406 CHARACTER GENERATOR
IC405 EEP ROM
IC402 MECHA CONTROL / SERVO
MECHA CONTROL
SERVO
VIDEO, AUDIO, SERVO CONTROL SIG.
IC410 LOADING MOTOR DRIVE
LOAD, UN LOAD
M903 LOADING MOTOR
(See Page 125) FP-442 BOARD
S001 MODE SWITCH
S005 CC DOWN
DEW SENSOR
MSW A-C
CC DOWN
DEW SENS
D001 TAPE LED
Q001 TAPE TOP SENSOR
TOP SENS
TAPE TOP DETECT
IC521
H001 T REEL FG SENSOR
H002 S REEL FG SENSOR
T REEL (+), (-)
S REEL (+), (-)
T REEL FG AMP
S REEL FG AMP
T REEL FG
S REEL FG
Q002 TAPE END SENSOR
END SENS
TAPE END DETECT
TAPE LED (K)
S002 ME/MP REC PROOF
ME/MP SW
REC PROOF SW
LS-33 BOARD (See Page 125)
(See Page 125)
IC521 (1/2) WAVE SHAPER
D PG, D FG
DRUM PG, DRUM FG
SL-33 BOARD
RF SWP
1/2 RF SWP
CLOG PB, SP/LP DET
M901 DRUM MOTOR
DRUM PG, FG
IC408 (1/2) DRUM MOTOR DRIVE
DRUM VS
DD-56 BOARD (See Page (1/2) 144)
DRUM PWM DRIVE
IC901 (1/3)
DRUM ERROR
IC408 (1/2) LPF
DRUM PWM
M902 CAPSTAN MOTOR
CAPSTAN FG
CFG (+), (-)
IC001 CAPSTAN MOTOR DRIVE WAVE SHAPER
CAP VS
IC901 (1/3) CAPSTAN PWM DRIVE
CAP ERROR
CAP PWM
CAP FG
REF PILOT
ATF ERROR
IC409 LANC I/O
LANC SO, LANC SI
LANC DATA
IC407 SIRCS CONTROL
SIRCS
IC403 MODE CONTROL
IC401 BACKUP Vdd SWITCH
BACKUP VDD
VTR UNREG
LI-3V
KEY IN 0 ~6
KEY OUT 0 ~5
(See Page 119) VK-32 BOARD
S976~981, 983 KEY MATRIX (POWER SWITCH VTR FUNCTION SWITCH)
(See Page 117) ED-37 BOARD
S986~990 KEY MATRIX (EDIT, REMOCON, DST, BEEP SWITCH)
CF-34 BOARD (See Page 118)
S991~996 KEY MATRIX (PROGRAM AE, COUNTER RESET FADER, DATE, TIME)
BEEP ON
SP991
LI 3V
LITHIUM BATTERY
LI-46 BOARD
(See Page 119)
(See Page 144)
SW-223 BOARD
S519, 520 KEY MATRIX (STANDBY, START/STOP SWITCH)
DD-56 BOARD (1/2)
(See Page 144)
S901 KEY MATRIX (EJECT SWITCH)
J902 REMOTE
CAM DD ON
CAM 15V
CAM -9V
CAM 5V
D4V
D5V
MT 5V
EVF 5V
AU 5V
VID 5V
RP 5V
VTR DD ON
IC901 (1/3) CAMERA DC/DC CONVERTER VTR DC/DC CONVERTER
EVF UNREG
VTR UNREG
MAIN BATTERY
VF-42 BOARD (See Page 141)
DY H V
DH1, DH2
T501
HV
H
H OUT
CRT DRIVE
G1
CRT
EVF VIDEO
IC501
C9

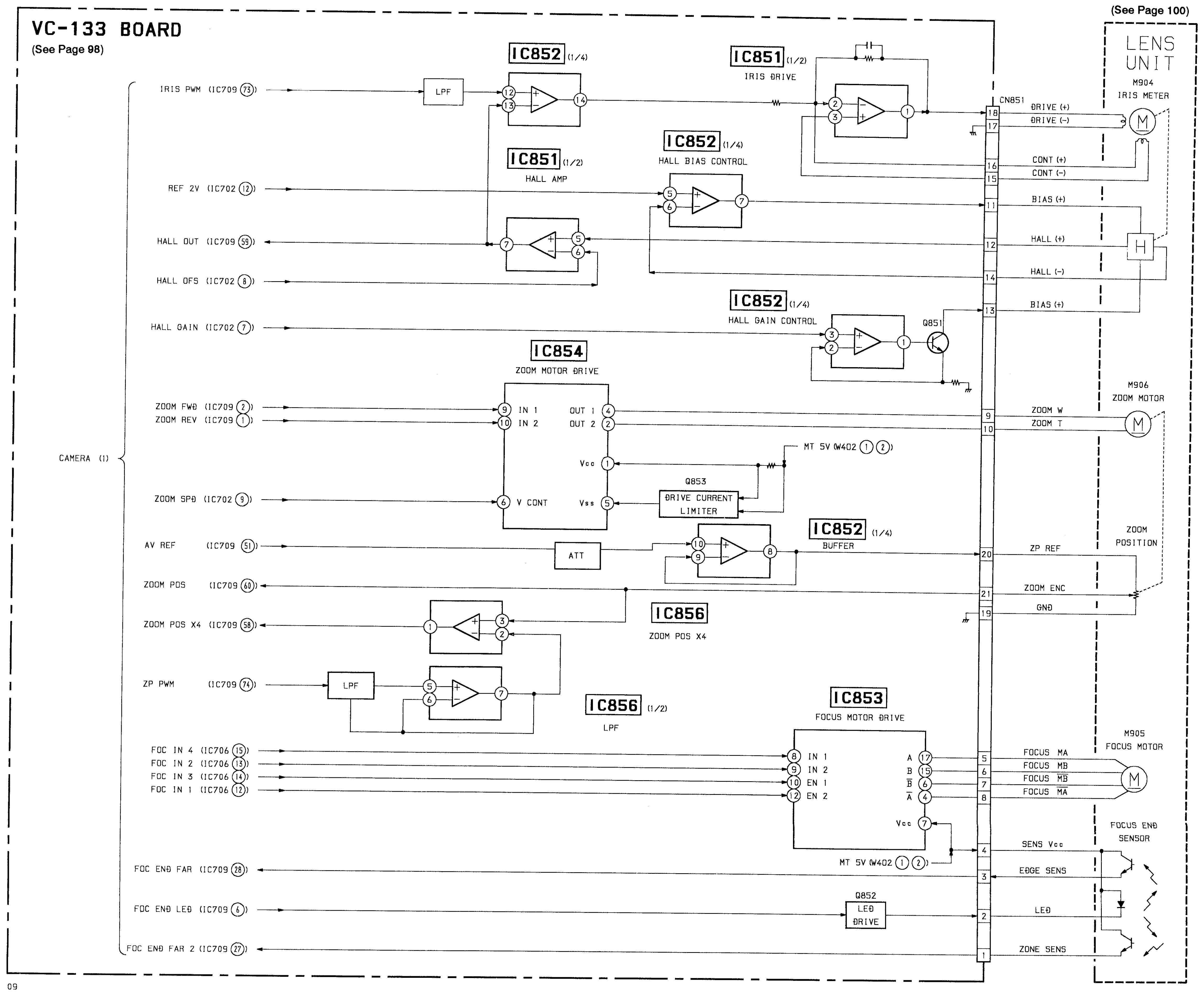
3-3. CAMERA (1) BLOCK DIAGRAM

(See Page 85)
CD-106 BOARD
IC875
CCD IMAGER
VC-133 BOARD (See Page 91, 94)
IC805
SIGNAL SEPARATION AGC/IRIS CONTROL
IC804
V DRIVE
IC801
TIMING GENERATOR
IC803
A/D BIAS AMP
IC802
A/D CONVERTER
IC707
CAMERA CORE DIGITAL CAMERA PROCESS
IC703
CHARACTER MIX
IC702
D/A CONVERTER
IC706
FOCUS/ZOOM PRE DRIVER
IC709
CAMERA CONTROL
IC712
EEP ROM
IC705
OPE
IC704
SYNC GENERATOR
VIDEO (1) WS-1000
SYSCON WS-1000
POWER WS-1000

3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON VC-133 BOARD: CXP80624-434R)

Pin No.	Signal	I/O	Function
1	ZOOM M REV	O	Zoom motor control signal. Normally "L". 15.7 msec period PWM signal when rotating to WIDE. "H" when rotating to TELE.
2	ZOOM M FWD	O	Zoom motor control signal. Normally "L". 15.7 msec period PWM signal when rotating to TELE. "H" when rotating to WIDE.
3			Not used.
4			
5			
6	FOC END LED	O	Focus end sensor LED control signal. Normally "L".
7	RT05/D5		Not used.
8	$\overline{\text{CORE RESET}}$	O	Camera core (IC707 on VC-133 board) reset signal. Normally "H". "L" when reset.
9	PDR RESET	O	Focus predriver (IC706 on VC-133 board) reset signal. Normally "H". "L" when reset.
10			Not used.
11	TG STBY0		
12	OPD RESET	O	OPD (IC705 on VC-133 board) reset signal. "H": camera mode. "L": VTR mode.
13			Not used.
14			
15			
16			
17			
18			
19			
20			
21	EPROM DO	O	Connected to +5V.
22	EPROM BUSY	I	BUSY signal from EEPROM. Normally "H". "L" pulse when data reading/writing.
23			Not used.
24			
25			Connected to GND.
26			Connected to +5V.
27	WIDE END	I	Focus Zone sensor input. Normally "L".
28	FOC END FAR	I	Focus edge sensor input. Normally "L".
29	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally "L".
30			Not used.
31			
32			
33			
34			
35			
36			
37	MP		Connected to GND.
38	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally "H". "L" when reset.
39	VSS		GND
40	XTAL	O	12 MHz clock oscillation circuit.
41	EXTAL	I	
42	$\overline{\text{CS CAM}}$	I	Chip select signal from mode control microprocessor. (IC403 on VS-100 board)
43	VTR SI	I	Serial data input from mode control microprocessor.
44	VTR SO	O	Serial data output from mode control microprocessor.
45	VTR SCK	I	Serial data transfer clock.
46			Not used.
47			
48			
49			Not used.
50	AVSS		GND
51	AVREF		Analog input port reference voltage (5V).
52	AVDD		Analog input port voltage (5V).
53			Connected to GND.
54			
55	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
56	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
57	ZOOM SW	I	Zoom key input. 0.4V: F. TELE, 1.4V: TELE and 3.7V: F. WIDE, 2.5V: WIDE and 5V: no input.
58	ZOOM POS X4	I	Zoom position voltage. approx. 0.4V (WIDE end) to approx. 2.8V (TELE end).
59	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
60	ZOOM POS	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
61			Connected to 5V.
62	PB V	I	VD signal input from mecha controler (IC402 on VS-100 board).
63	PG5/SYNC1		Connected to +5V.
64	VTR SYNC		
65	PB CTL		
66	DPG		
67			
68	AF BUSY	I	AF busy signal.
69			Not used.
70			
71			
72			
73	IRIS PWM	O	Iris control signal. 21 μsec period PWM signal.
74	ZM PWM	O	Zoom position detection voltage output. 21 μsec period PWM signal.
75			Not used.
76			Connected to +5V.
77	CAM SI	I	Serial data input.
78	CAM SO	O	Serial data output.
79	$\overline{\text{CAM SCK}}$	O	Serial data transfer clock.
80	AJST	I	Adjustment timing pulse input. Normally "H".
81	PI/TO		Not used.
82	PI/PWM		
83	PI/PO		
84	PI O		Connected to +5V.
85	PKO		
86	GND		GND
87	VDD		+5V power supply.
88	VPP		
89			Not used.
90	$\overline{\text{CS PDR}}$	O	Chip select signal to focus predriver (IC706 on VC-133 board).
91	$\overline{\text{CS CAM D/A}}$	O	Chip select signal to camera EVR (IC702 on VC-133 board).
92	CS ROM	O	Chip select signal to EEPROM (IC712 on VC-133 board).
93	$\overline{\text{CS OPD}}$	O	Chip select signal to OPD (IC705 on VC-133 board).
94	$\overline{\text{NTSC}}$	O	NTSC: "L", PAL: "H".
95	$\overline{\text{CS CORE}}$	O	Chip select signal to camera core (IC707 on VC-133 board).
96	$\overline{\text{CS TG}}$	O	Chip select signal to timing generator (IC801 on VC-133 board).
97			Not used.
98	$\overline{\text{CS A/D}}$	O	Chip select signal to Zoom position A/D converter. Not used.
99			Not used.
100			

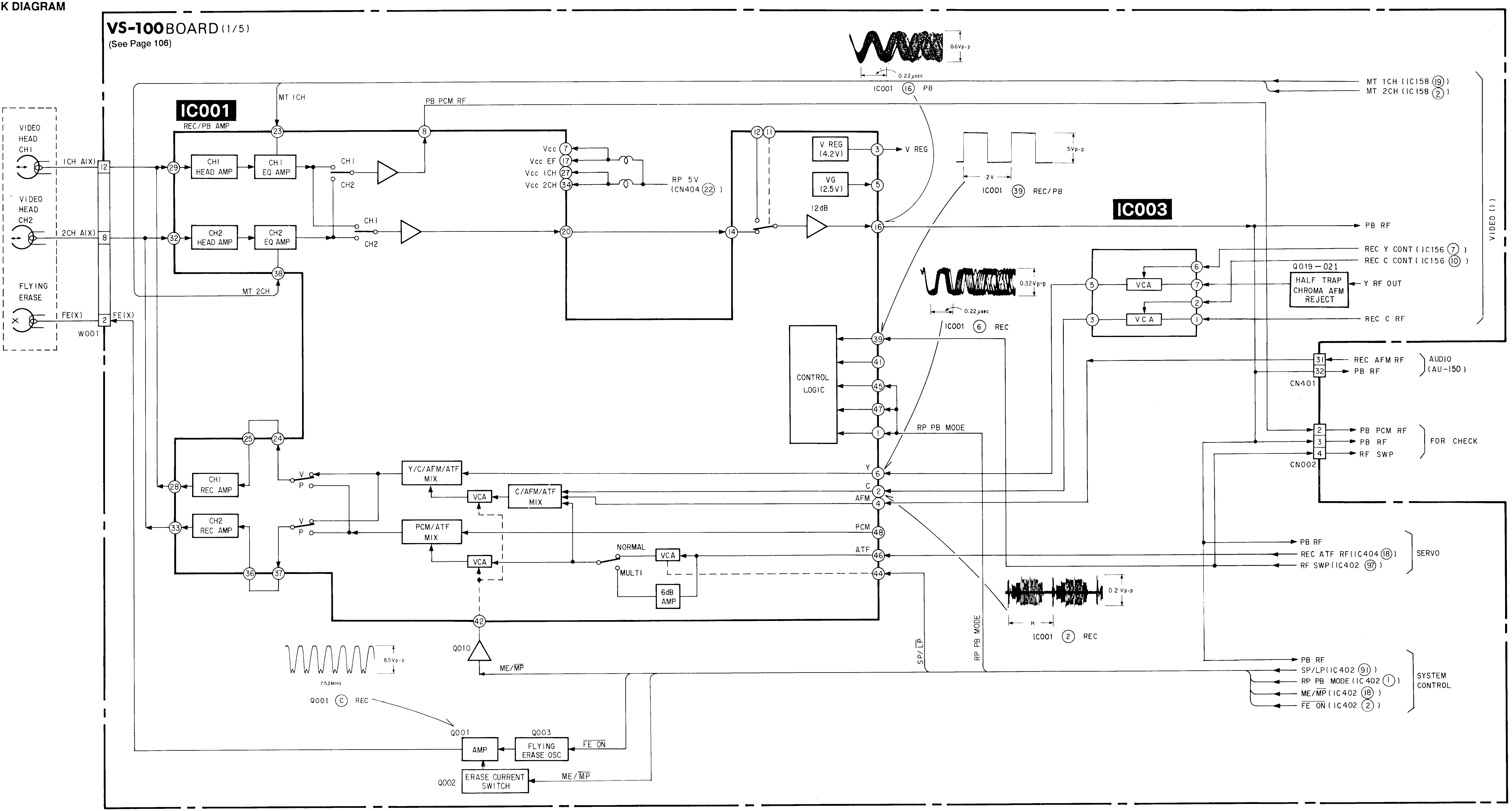
3-5. CAMERA (2) BLOCK DIAGRAM


VC-133 BOARD
(See Page 98)
CAMERA (1)
IRIS PWM (IC709 (73))
REF 2V (IC702 (12))
HALL OUT (IC709 (59))
HALL OFS (IC702 (8))
HALL GAIN (IC702 (7))
ZOOM FWD (IC709 (2))
ZOOM REV (IC709 (1))
ZOOM SPD (IC702 (9))
AV REF (IC709 (51))
ZOOM POS (IC709 (60))
ZOOM POS X4 (IC709 (58))
ZP PWM (IC709 (74))
FOC IN 4 (IC706 (15))
FOC IN 2 (IC706 (13))
FOC IN 3 (IC706 (14))
FOC IN 1 (IC706 (12))
FOC END FAR (IC709 (28))
FOC END LED (IC709 (6))
FOC END FAR 2 (IC709 (27))
LPF
IC852 (1/4)
IC851 (1/2)
HALL AMP
IC851 (1/2)
IRIS DRIVE
IC852 (1/4)
HALL BIAS CONTROL
IC852 (1/4)
HALL GAIN CONTROL
Q851
IC854
ZOOM MOTOR DRIVE
IN 1
IN 2
OUT 1
OUT 2
Vcc
V CONT
Vss
MT 5V (W402 (1) (2))
Q853
DRIVE CURRENT LIMITER
ATT
IC852 (1/4)
BUFFER
IC856
ZOOM POS X4
IC856 (1/2)
LPF
IC853
FOCUS MOTOR DRIVE
IN 1
IN 2
EN 1
EN 2
A
B
$\overline{\text{B}}$
$\overline{\text{A}}$
Vcc
MT 5V (W402 (1) (2))
Q852
LED DRIVE
CN851
(See Page 100)
LENS UNIT
M904
IRIS METER
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (+)
HALL (-)
BIAS (+)
M906
ZOOM MOTOR
ZOOM W
ZOOM T
ZOOM POSITION
ZP REF
ZOOM ENC
GND
M905
FOCUS MOTOR
FOCUS MA
FOCUS MB
FOCUS $\overline{\text{MB}}$
FOCUS $\overline{\text{MA}}$
FOCUS END SENSOR
SENS Vcc
EDGE SENS
LED
ZONE SENS
09

3-6. VIDEO (1) BLOCK DIAGRAM

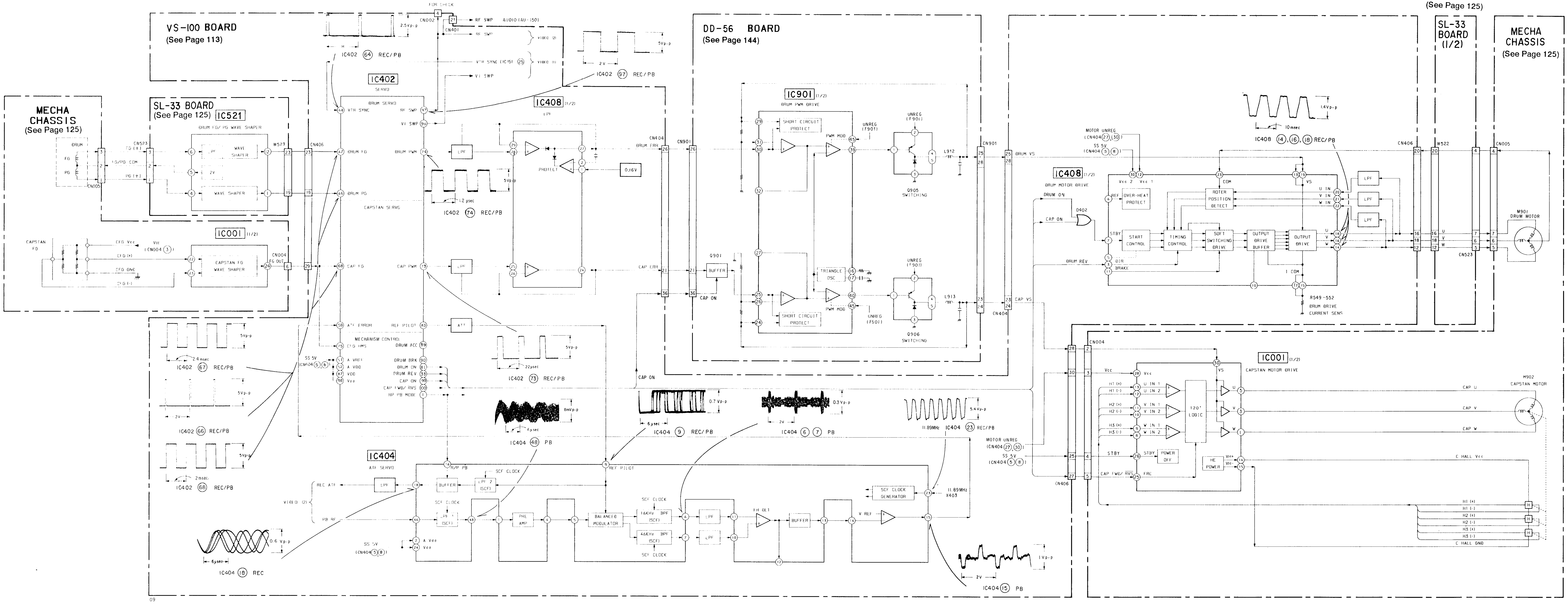
VS-100 BOARD
(See Page 110)
JK-99 BOARD
(See Page 119)
IC151
Y PROCESS
IC152
CHROMA PROCESS
IC154
IC155
IC156
EVR (D/A CONVERTER)
IC158
EVR (D/A CONVERTER)
IC159
MAIN-EMPHASIS
SUB-EMPHASIS
NOISE CANSEL
Y COMB FILTER
COMB FILTER
Y/C MIX
CHARACTER MIX
VIDEO OUT
EVF OUT
CAMERA (1)
AUDIO

3-7. VIDEO (2) BLOCK DIAGRAM


VS-100 BOARD (1/5)
(See Page 106)
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
1CH A(X)
2CH A(X)
FE(X)
W001
IC001
REC/PB AMP
MT 1CH
MT 2CH
PB PCM RF
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
RP 5V (CN404 ㉒)
V REG (4.2V)
VG (2.5V)
V REG
12dB
0.6Vp-p
0.22μsec
IC001 ⑯ PB
5Vp-p
2V
IC001 ㊴ REC/PB
IC003
PB RF
REC Y CONT (IC156 ⑦)
REC C CONT (IC156 ⑩)
Q019–021
HALF TRAP CHROMA AFM REJECT
Y RF OUT
REC C RF
VCA
0.32Vp-p
0.22μsec
IC001 ⑥ REC
CONTROL LOGIC
RP PB MODE
REC AFM RF
PB RF
AUDIO (AU-150)
CN401
PB PCM RF
PB RF
RF SWP
FOR CHECK
CN002
VIDEO (1)
CH1 REC AMP
CH2 REC AMP
V
P
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
Y
C
AFM
PCM
ATF
NORMAL
MULTI
6dB AMP
0.2Vp-p
H
IC001 ② REC
PB RF
REC ATF RF (IC404 ⑱)
RF SWP (IC402 (97))
SERVO
SP/LP
RP PB MODE
Q010
ME/MP
8.5Vp-p
7.53MHz
Q001 Ⓒ REC
PB RF
SP/LP (IC402 (91))
RP PB MODE (IC402 ①)
ME/MP (IC402 ⑱)
FE ON (IC402 ②)
SYSTEM CONTROL
Q001
AMP
Q003
FLYING ERASE OSC
FE ON
Q002
ERASE CURRENT SWITCH
ME/MP

09

3-8. SERVO BLOCK DIAGRAM


VS-100 BOARD
(See Page 113)
MECHA CHASSIS
(See Page 125)
SL-33 BOARD
(See Page 125)
IC521
DRUM FG/PG WAVE SHAPER
WAVE SHAPER
IC001 (1/2)
CAPSTAN FG WAVE SHAPER
CAPSTAN FG
CN523
CN005
W523
CN406
CN004
IC402
SERVO
DRUM SERVO
CAPSTAN SERVO
MECHANISM CONTROL
VTR SYNC
RF SWP
VI SWP
DRUM FG
DRUM PG
DRUM PWM
CAP FG
CAP PWM
ATF ERROR
REF PILOT
CFG RMS
DRUM BRK
DRUM ON
DRUM REV
CAP ON
CAP FWD/RVS
RP PB MODE
FOR CHECK
CN002
CN401
RF SWP
AUDIO (AU-150)
VIDEO (2)
VIDEO (1)
VTR SYNC (IC151)
VI SWP
IC402 64 REC/PB
IC402 97 REC/PB
IC402 74 REC/PB
IC402 67 REC/PB
IC402 66 REC/PB
IC402 68 REC/PB
IC402 73 REC/PB
IC408 (1/2)
LPF
PROTECT
0.16V
ATF
DD-56 BOARD
(See Page 144)
IC901 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
PWM MOD
TRIANGLE OSC
UNREG (F901)
UNREG (F501)
Q905 SWITCHING
Q906 SWITCHING
Q901 BUFFER
L912
L913
CN404
CN901
DRUM FRH
CAP FRH
CAP ON
DRUM VS
CAP VS
IC404
ATF SERVO
BUFFER
LPF (SCF)
SCF CLOCK
PRE AMP
BALANCED MODULATOR
16KHz BPF (SCF)
46KHz BPF (SCF)
FH DET
V REF
SCF CLOCK GENERATOR
11.89MHz X403
REC ATF
VIDEO (2)
PB RF
SS 5V (CN404 5 8)
A VDD
VDD
IC404 18 REC
IC404 48 PB
IC404 9 REC/PB
IC404 6 7 PB
IC404 23 REC/PB
IC404 15 PB
IC408 14, 16, 18 REC/PB
IC408 (1/2)
DRUM MOTOR DRIVE
MOTOR UNREG (CN404 27 30)
SS 5V (CN404 5 8)
OVER-HEAT PROTECT
ROTOR POSITION DETECT
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
DIR
BRAKE
R549-552 DRUM DRIVE CURRENT SENS
Q402
SL-33 BOARD (1/2)
(See Page 125)
W522
CN523
M901 DRUM MOTOR
IC001 (1/2)
CAPSTAN MOTOR DRIVE
120° LOGIC
STBY POWER OFF
HE POWER
M902 CAPSTAN MOTOR
CAP U
CAP V
CAP W
C HALL Vcc
C HALL GND
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
5Vp-p
1.4Vp-p
0.7Vp-p
0.3Vp-p
0.6Vp-p
5.4Vp-p
8mVp-p
1Vp-p
10msec
2.4msec
22μsec
1.2μsec
6μsec
2V
H

3-9. SYSTEM CONTROL BLOCK DIAGRAM

VK-32 BOARD (See Page 119)
ED-37 BOARD (See Page 118)
CF-34 BOARD (See Page 118)
CN-73 BOARD (See Page 117)
VS-100 BOARD (See Page 113)
SL-33 BOARD (See Page 125)
MECHA CHASSIS (See Page 125)
LM-40 BOARD
FP-442 BOARD
LS-33 BOARD
MF-214 BOARD (See Page 118)
SW-223 BOARD (See Page 144)
DD-56 BOARD (See Page 144)
LI-46 BOARD (See Page 119)
WS-11 BOARD (See Page 132)
ZOOM SWITCH UNIT (See Page 132)
AU-150 BOARD (See Page 132)
IC403 MODE CONTROL (MASTER)
IC407 SIRCS CONTROL
IC405 EEPROM
IC402 MECHANISM CONTROL
IC410 LOADING MOTOR DRIVE
IC501 WAVE SHAPER
IC409 LANC I/O
IC401
IC406 CHARACTER GENERATOR
IC404 SP/LP DETECT CLOG DETECT
IC605 REMOTE CONTROL RECEIVER
SERVO
VIDEO (2)
VIDEO (1)
AUDIO (JK-99)
AUDIO (AU-150)
CAMERA (1)
LITHIUM BATTERY
X402 32.768kHz
X401 4.19MHz
X404 700kHz
X403 11.89MHz

3-10. MECHANISM CONTROL MICROPROCESSOR PIN FUNCTION (IC402 ON VS-100 BOARD: CXP80624-416R)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	PB3/PP011	RP PB MODE	O		REC/PB select signal of REC/PB amplifier (IC001 on VS-100 board) and ATF servo IC (IC404 on VS-100 board). "H": PB.
2	PB2/PP010	$\overline{\text{FE ON}}$	O		Flying erase oscillation ON/OFF control signal. "L": oscillation.
3	PB1/PP09	JOG VD	O		False VD signal to be inserted into playback video signal during variable speed playback.
4	PB0/PP08	JOG	O		Variable speed/normal speed playback select signal of video circuit. "H" when variable speed playback.
5	PC7/RT07	JACK $\overline{\text{IN}}$/OUT	I	JK	Not used. Connected to +5V.
6	PC6/RT06	1.7M DET	I	AU	Normal/stereo discrimination input. "H" when AFM stereo tape playback.
7	PC5/RT05	JACK $\overline{\text{MONO}}$/STE DET	I	JK	Jack monaural/stereo discrimination input. "H": monaural (No jack inserted in right terminal).
8	PC4/RT04	INT VD	I		Not used.
9	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.
10	PC2/RT018	$\overline{\text{SYNC DET OUT}}$	O		Sync detect output. "L" when Sync is detected.
11	PC1/RT017	E/$\overline{\text{L}}$ DET	I		Not used.
12	PC0/RT016	MIC $\overline{\text{MONO}}$/ST DET	I	AU	External microphone monaural/stereo discrimination input. "L" when monaural microphone used.
13	PJ7	M SW 0	I	MD	Mode switch input.
14	PJ6	M SW 1	I	MD	
15	PJ5	M SW 2	I	MD	
16	PJ4	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment down switch input. "L": down.
17	PJ3	$\overline{\text{REC PROOF}}$	I	MD	Erasure protection switch input. "L" when REC prohibit.
18	PJ2	ME/$\overline{\text{MP}}$	I	MD	ME/MP switch input. "L": MP, "H": ME.
19	PJ1	HG/$\overline{\text{NOR}}$	I	MD	Connected to GND.
20	PJ0	VIDEO MUTE	O		Video output mute signal. "H": mute.
21	PD7	LINE MIX	I	AU	AUDIO OUT monaural/stereo select signal. "H": monaural.
22	PD6	MX SEL 1	I	AU	Matrix select signal.
23	PD5	MX SEL 2	I	AU	
24	PD4	MX ON/$\overline{\text{OFF}}$	O	AU	Matrix ON/OFF signal. "H" when matrix ON (stereo).
25	PD3	E MODE	O		Not used.
26	PD2	CAM/$\overline{\text{LINE}}$	O		Camera input/line input select signal. "H" when camera input.
27	PD1	DS ON	O		Data screen ON/OFF signal. "H": ON.
28	PD0	$\overline{\text{EDIT}}$	O		Video circuit EDIT/NORMAL switch signal. "L": EDIT.
29	PH7	UNLOAD	O		Loading motor control signal. "H" or "H" pulse when unloading.
30	PH6	LOAD	O		Loading motor control signal. "H" or "H" pulse when loading.
31	PH5	$\overline{\text{LM LIM COM}}$	O		Loading motor limiter control signal. Temporary "H" when loading.
32	PH4	COMP REC	O		Not used.
33	PH3	DRUM REV	O		Drum rotating control signal . Normally "L".
34	PH2		O		N.C.
35	PH1		O		
36	PH0	$\overline{\text{REEL HALL CONT}}$	O		Reel FG sensor (HALL element) power supply control signal.
37	MP	MP			Connected to GND.
38	RST	$\overline{\text{RESET}}$	I	MODE CON	Reset signal from mode control microprocessor. "L" when reset.
39	VSS	VSS			GND
40	XTAL	XTAL	I		11.89 MHz clock oscillation circuit.
41	EXTAL	EXTAL	O		
42	CSO	$\overline{\text{VTR COSMO CS}}$	I	MODE CON	Chip select signal from mode control microprocessor (VS-100 board IC403)
43	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.
44	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
45	SCKO	$\overline{\text{SCK}}$	I	MODE CON	Serial clock input from mode control microprocessor.
46	PF7/AN11	AUDIO MUTE	O	AU	Audio output mute signal. "H": mute.
47	PF6/AN10	1.7M OFF	O	AU	1.7 MHz REC AFM carrier ON/OFF signal. "H": OFF (monaural recording).
48	PF5/AN9	GND	I		GND
49	PF4/AN8	GND	I		
50	AVSS	AVSS			Analog port GND.
51	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
52	AVDD	VDD			Analog port power supply (5V).
53	PF3/AN7	N.C.			Connected to GND.
54	PF2/AN6	END SENS	I	SL	Tape end detection signal. Normally "L", "H" pulse: tape end.
55	PF1/AN5	TOP SENS	I	SL	Tape top detection signal. Normally "L", "H" pulse: tape top.
56	PF0/AN4	DEW	I	MD	Dew condensation detection signal. "L" when dew condensation.
57	AN3	BATT SENSE	I		Battery voltage input for battery end detection. 1/2 divided by RB401.
58	AN2	ATF ERROR	I		ATF error, ATF lock error input.
59	AN1	S REEL FG	I	SL	S reel FG signal input.
60	AN0	T REEL FG	I	SL	T reel FG signal input.
61	PG7/EXI1	PG7 (N.C.)			Connected to GND.
62	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
63	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
64	PG4/SYNC0	VTR SYNC	I		Composite sync signal separated from REC/PB Y signal.
65	PG3/PBCTL	PB SP/LP DET	I		Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
66	PG2/DPG	DRUM PG	I	SL	Drum PG signal input. For drum phase servo 33.3 msec period "H" pulse.
67	PG1/DFG	DRUM FG	I	SL	Drum FG signal input. For drum speed servo 2.8 msec period pulse.
68	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 994 Hz when REC/PB (SP).
69	PE7/DAB0	N.C.	O		N.C.
70	PE6/DAB0	T/E LED ON	O		Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
71	PE5/DAA1	N.C.	O		N.C.
72	PE4/DAA0	N.C.	O		
73	PE3/PWM1	CAP PWM	O		Capstan error signal output 20.15 μsec PWM signal.
74	PE2/PWM0	DRUM PWM	O		Drum error signal output 20.15 μsec PWM signal.
75	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
76	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
77	P17/ST1	LANC IN	I	DD	Control L serial data input.
78	P16/SO1	LANC OUT	O	DD	Control L serial data output.
79	P15/SCK1	LM LIMIT DET	I		Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
80	P14/INT1	AGC SLOW			Not used.
81	P13/TO	DRUM ON	O		Drum driver ON/OFF control signal. "H" when drum ON.
82	P12/PWM	CLOG	O		Head clog detection signal. "L" when no trouble.
83	P11/PO	REF PILOT	O		ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=102.52 kHz, f2=118.95 kHz, f3=165.21 kHz and f4=148.69 kHz.
84	P10/PCK				Connected to +5V.
85	PKO	13/10 SW	I	MD	Not used.
86	VSS	VSS			GND
87	VDD	VDD			VDD
88	N.C.	(VPP)			Connected to +5V.
89	PA7/PP07	DRUM ACC	O		Drum motor acceleration signal. Not used.
90	PA6/PP06	DRUM BRK	O		Drum motor brake signal. Normally "L".
91	PA5/PP05	SP/$\overline{\text{LP}}$	O		SP/LP select signal. "L": LP.
92	PA4/PP04	AU IN/OUT	O		Not used.
93	PA3/PP03	VIDEO O SW	O		VIDEO OUT inhibit signal. "H": inhibit. Not used.
94	PA2/PP02	VIDEO I SW	O		VIDEO IN/OUT select signal. Not used.
95	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. "H": PB.
96	PA0/PP00	VI SWP	O		RF switching pulse signal for video circuit. 30 Hz, 50% duty pulse.
97	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 30 Hz, 50% duty pulse.
98	0	H CHG	O		Not used.
99	11	CAP ON	O	MD	Capstan driver ON/OFF control signal. "H" when capstan ON.
100	PB4/PP012	CAP FWD/$\overline{\text{RVS}}$	O	MD	Capstan rotating direction control signal. "H": FWD, "L": RVS.

	BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF
M SW 0	L	L	L	H	L	H	H	L	L
M SW 1	L	H	L	L	L	L	H	H	L
M SW 2	L	H	H	H	H	L	L	L	L

	STEREO	MAIN	SUB
MX SEL 1	L	L	H
MX SEL 2	L	H	L

3-11. MODE CONTROL MICROPROCESSOR PIN FUNCTION (IC403 ON VS-100 BOARD: μPD75316GF-318-3B9)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		
13	S24/BP0	$\overline{\text{EEPROM CS}}$	O		Chip select signal to EEPROM (IC406 on VS-100 board). 1/2V period "L" pulse.
14	S25/BP1	N.C	O		Not used.
15	S26/BP2	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on VC-133 board). Normally "L".
16	S27/BP3		O		N.C.
17	S28/BP4	$\overline{\text{CS TITLE}}$	O	CAM	Not used.
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC907 on VS-100 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Not used.
20	S31/BP7	$\overline{\text{CAM COSM CS}}$	O	CAM	Chip select signal to camera controller (IC709 on VC-133 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor. Not used.
26	VLC0	VCC 0	I		Power source 0 input — Power source for LCD dirve. Not used.
27	VLC1	VCC 1	I		Power source 1 input
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	$\overline{\text{SYS RESET}}$	O	all	Output signal to reset each IC when power is turned on. Normally "H".
32	P43	$\overline{\text{TALLY}}$	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	$\overline{\text{BATT IN}}$	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/$\overline{\text{SCK}}$	$\overline{\text{SCK}}$	O	all	Serial clock output terminal, Serial clock (2 μS) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 μS) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 μS) communication.
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC402 on VS-100 board).

Pin No.	Port Name	Signal	I/O	Connection	Function
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Not used.
46	P20/PT00	VTR DD ON	O	PS	VTR power source (VIDEO 5V, RP 5V, AUDIO 5V, EVF 5V, D5V, (SS5V), D4V, CORE 4V) control signal. "H" when power switch is in "PLAYER" or "CAMERA" position.
47	P21	CAM DD ON	O	PS	CAMERA power source (CAM 5V, +15V, –9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC156, 158 on VS-100 board). 1V period "H" pulse.
49	P23/BUZ	BEEP	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC151 on VS-100 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC402 on VS-100 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on VC-133 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC406 on VS-100 board). 1V period "H" pulse.
54	VDD	VDD			VDD (+5V)
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			N.C.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment lock switch input. "L": Lock.
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		System reset input. "L": Reset, Normally: "H".
69	S0	CLK CHK	O		N.C.
70	S1	S1	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
71	S2	S2	O		
72	S3	S3	O		
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

3-12. INTERFACE

3-12-1. System Control – Video/Audio Block Interface (VS-100 BOARD)

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *3		REC *4	REC *4 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
SP/$\overline{\text{LP}}$	O	IC402 (91)	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*1	*2	*2	H	H	H	H	*2	*2	H	H
VA PB MODE	O	IC402 (95)	L	L	L	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE *13	O	IC402 ㊻	L	L	L	H	H	L	H	H	H	H	H	L	H	H	L	L	L	L	H	H	H	H
VIDEO MUTE	O	IC402 ⑳	*14	*14	*14	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*14	*14	L	L	*15	*15	*15	*15
CAM/$\overline{\text{LINE}}$	O	IC402 ㉖	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L
JOG VD	O	IC402 ③	L	L	L	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	L	L	L	L	*5	*5	*5	*5
RP PB MODE	O	IC402 ①	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	IC402 ②	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
RF SWP	O	IC402 (97)	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC402 ④	L	L	L	H	H	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
$\overline{\text{VIDEO CS}}$	O	IC403 ㊿	V period "L" pulse																					
$\overline{\text{VIDEO D/A CS}}$	O	IC403 ㊽	V period 'H" pulse																					
DATA TO MSTR	I	IC403 ㊶	V period "L" pulse																					
DATA TO SLVE	O	IC403 ㊵	V period pulse train																					
$\overline{\text{SCK}}$	I	IC403 ㊴	V period "H" pulse																					
PB SP/$\overline{\text{LP}}$ DET	I	IC402 (65)	L	*10	*10	*10	*10	L	*10	*10	*10			*10	L	*10	H	H	H	H	L	*10	L	*10
CLOG	I	IC402 (82)	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
VTR SYNC	I	IC402 (64)	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs discrimination result of the mode just before. "H": SP mode, "L": LP mode.
*2. Outputs discrimination result of the playback tape. "H" : SP mode, "L": LP mode.
*3. Edit search button pressed when playback pause mode.
*4. Mode for adjustment.
*5. False VD signal
*7. 30 Hz duty 50% pulse (synchronized with drum rotation)
*10. "H": SP recording area on tape. "L": LP recording area.
*11. "H": no recording area or drop out area on tape. Head clog detection input.
*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (polarity +)
*13. "H" during camera mode load/unload.
*14. "L" when external input (video) present. "H" when other cases.
*15. "H" when tape no signal. "L" when other cases.

3-12-2. System Control – Servo Block Interface

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *13		REC *14	REC *14 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
T.REEL FG	I	IC402 (60)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	IC402 (59)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	IC402 (58)	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC402 (66)	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC402 (67)	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC402 (68), (75)	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC402 (99)	L	H	H	H	H	H	H	H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
REF PILOT	O	IC402 (83)	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC402 ①	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
DRUM REV *10	O	IC402 ㉝	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/ $\overline{\text{RVS}}$	O	IC402 (100)	L	H	L	H	L	H	H	L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
DRUM PWM	O	IC402 (74)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC402 (73)	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC402 ㉛	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON *12	O	IC402 (81)	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

*1. Inputting waveform which is similar to sine wave according to reel rotation.

*2. ATF error voltage input

*3. One PG pulse input per one drum rotation, approx. 30 Hz.

*4. 12 FG pulses input per one drum rotation, approx. 360 Hz.

*5. 520 FG pulses input per one capstan rotation. Approx. 994 Hz when REC/PB (SP).
498 Hz when PB (LP).

*6. Four frequencies output synchronized with drum rotation. f1=102.54 kHz, f2=118.95 kHz, f3=165.21 kHz and f4=148.69 kHz

*7. f2 (118.95 kHz) output

*8. "H" pulse when tape run.

*9. 21.5 μsec period PWM signal

*10. Normally "H". Temporary "L" when load (drum reverse rotation).

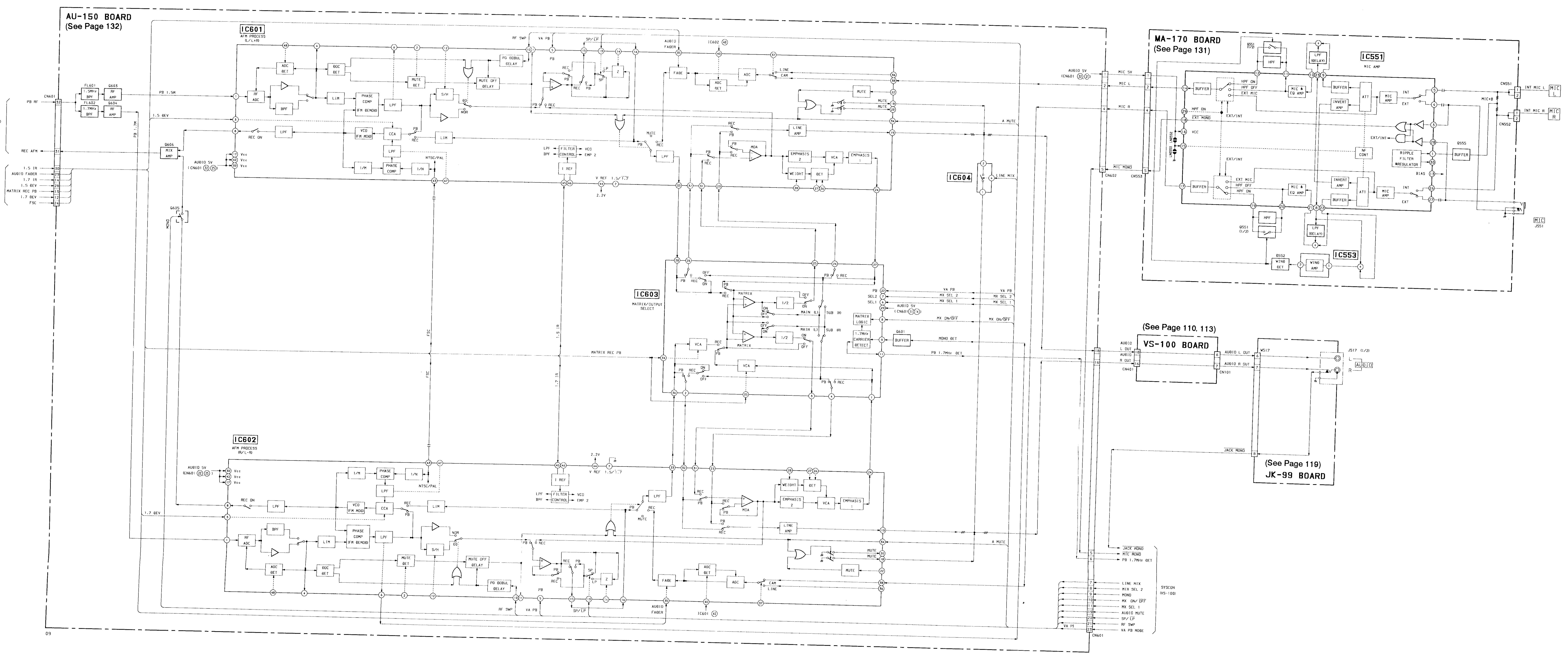
*11. Temporary "H" when cassette loading (finger catch protection).

*12. "H": approx. 1.3 Vdc

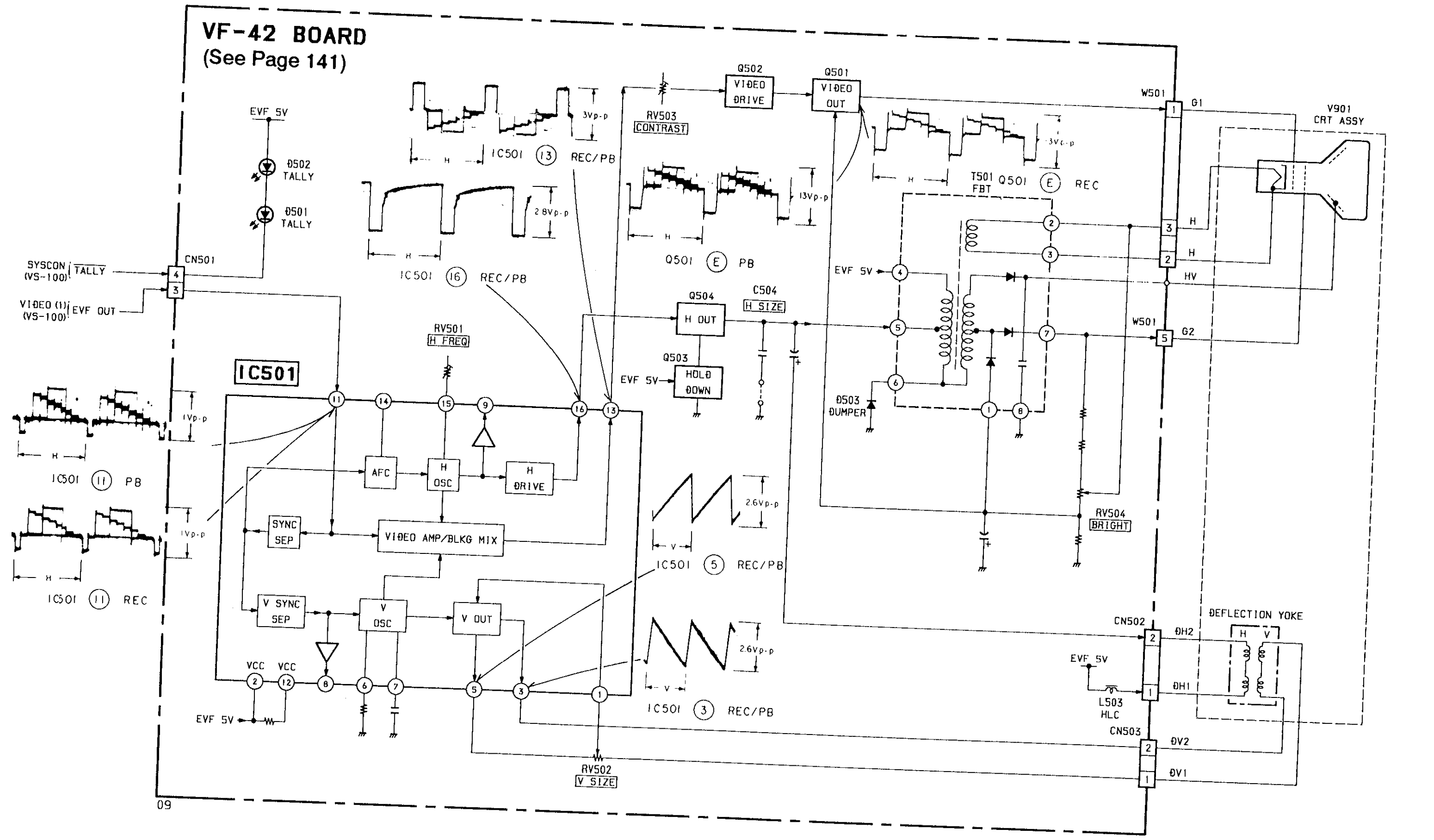
*13. Edit search button pressed when playback pause mode.

*14. Mode for adjustment.

3-13. AUDIO BLOCK DIAGRAM


AU-150 BOARD
(See Page 132)
IC601
IC602
IC603
IC604
MA-170 BOARD
(See Page 131)
IC551
IC553
(See Page 110, 113)
VS-100 BOARD
(See Page 119)
JK-99 BOARD
MIC
AUDIO

3-14. EVF BLOCK DIAGRAM

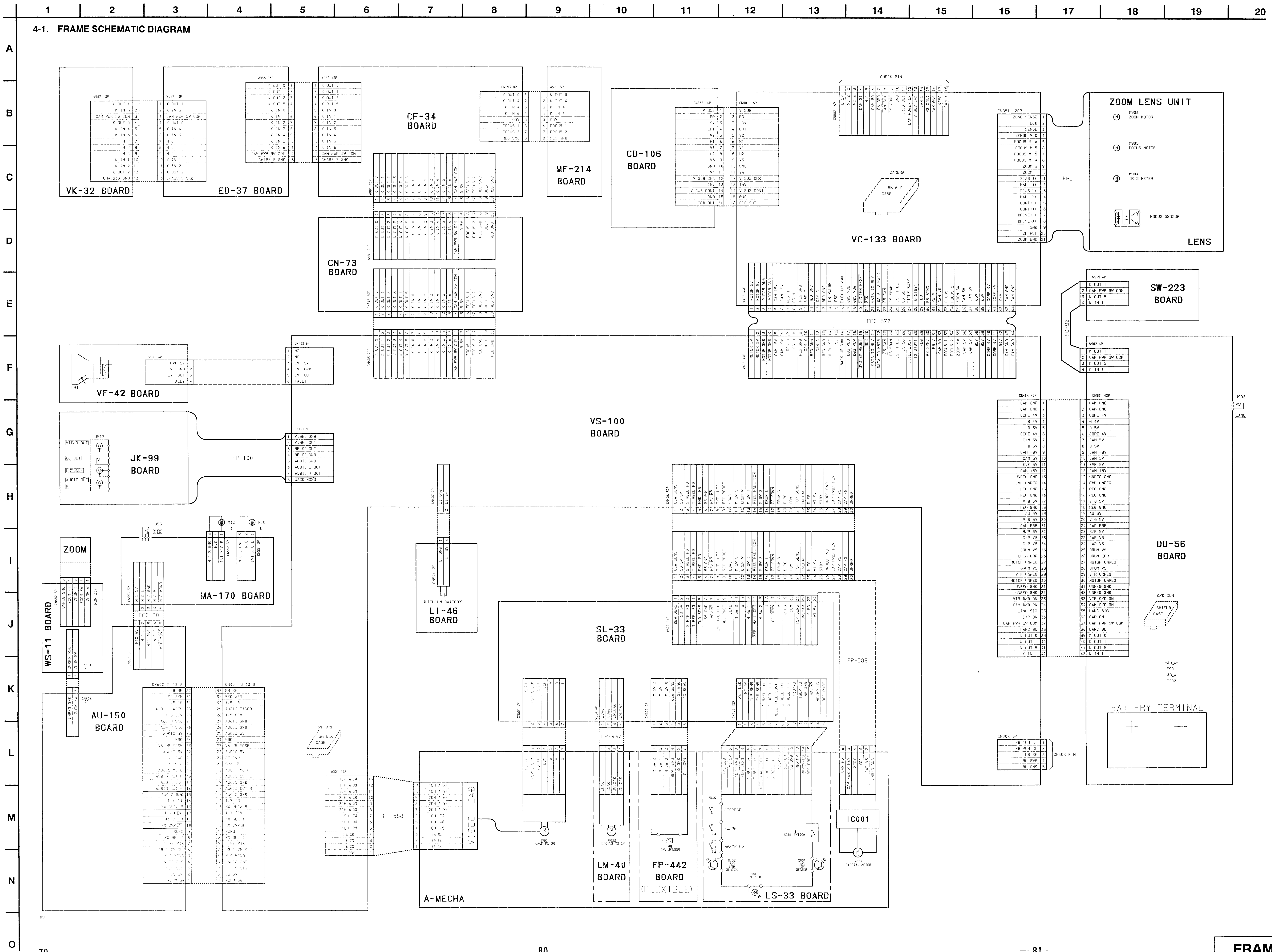

VF-42 BOARD
(See Page 141)
IC501
V901
CRT ASSY
DEFLECTION YOKE

3-15. POWER BLOCK DIAGRAM

SW-223 BOARD
MECHA CHASSIS
IC001
SL-33 BOARD
IC521
DD-56 BOARD (1/3)
IC901
J901 BATTERY TERMINAL
J902 REMOTE
LANC SIG
LANC DC
IC410
IC409
VS-100 BOARD
IC405
IC406
IC408
IC404
IC402
IC407
IC401
IC403
IC151
IC152
IC154
IC156
IC158
IC159
IC001
IC003
JK-99 BOARD
AU-150 BOARD
IC601-604
IC605
MA-170 BOARD
IC551
ELECTRIC VIEW FINDER
IC501
VF-42 BOARD
CN-73 BOARD
CF-34 BOARD
MF-214 BOARD
ED-37 BOARD
VK-32 BOARD
LI-46 BOARD
LITHIUM BATTERY
VC-133 BOARD
CD-106 BOARD
IC875
IC804
IC801
IC805
IC803
IC802
IC706
IC702
IC704
IC705
IC707
IC709
IC712
IC851
IC852
IC856
IC853
IC854
LENS BLOCK

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


VK-32 BOARD
ED-37 BOARD
CF-34 BOARD
MF-214 BOARD
CD-106 BOARD
VC-133 BOARD
ZOOM LENS UNIT
LENS
FPC
CN-73 BOARD
SW-223 BOARD
FFC-572
FFC-92
VF-42 BOARD
CRT
JK-99 BOARD
FP-100
VS-100 BOARD
DD-56 BOARD
ZOOM
WS-11 BOARD
MA-170 BOARD
FFC-90
LI-46 BOARD
SL-33 BOARD
FP-589
AU-150 BOARD
BATTERY TERMINAL
CHECK PIN
FP-588
VIDEO HEAD
A-MECHA
LM-40 BOARD
FP-442 BOARD (FLEXIBLE)
LS-33 BOARD
IC001
SHIELD CASE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
A B C D E F G H I J K L M N O

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▨ : Pattern from the side which enables seeing.
  (The other layers'patterns are not indicated.)
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- Through hole is omitted.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.*
- —— : B+ Line.*
- - - - : B– Line.*
- ⇒ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

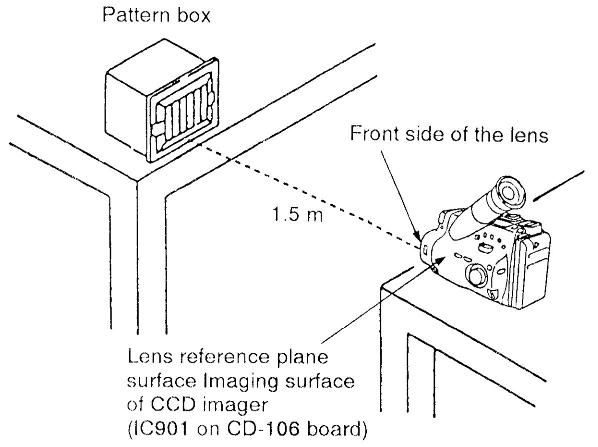
Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

*: indicated by the color red.

- **Measuring conditions voltage value and waveform.**
  (CAMERA REC mode)
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.*
  Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC901 on CD-106 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

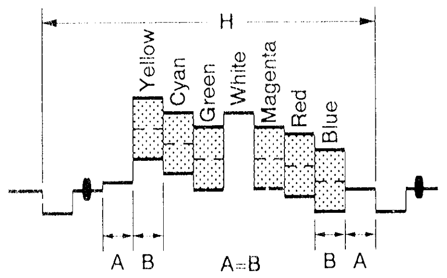

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A=B
B
A

Fig. a (Video output terminal output waveform)

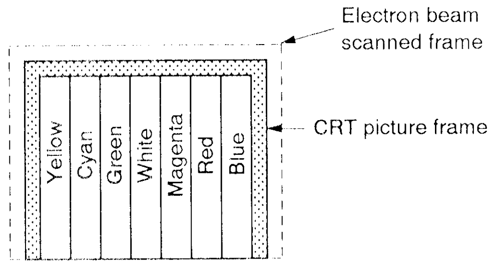

Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. b (Picture on monitor TV)

(REC/PB mode)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

Note: Refer to "9-1-3. How to set the REC mode".

CD-106 (CCD IMAGER) PRINTED WIRING BOARD

— Ref. No. CD-106 BOARD: 1000 series —

- **For printed wiring boards.**
- CD-106 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

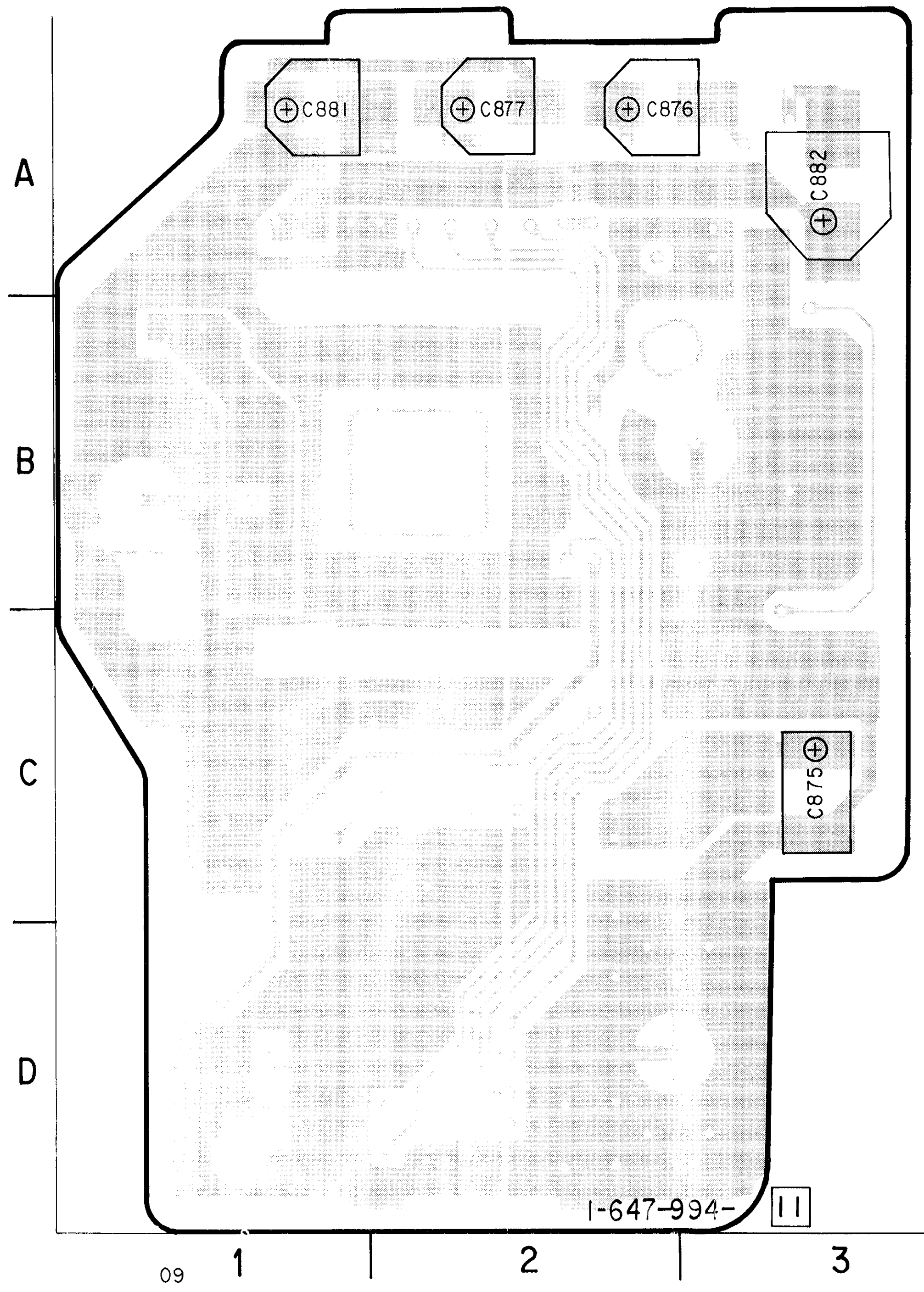
< DIODE >

D875	8-719-800-76	DIODE	1SS226
D876	8-719-404-46	DIODE	MA110
D877	8-719-820-05	DIODE	1SS181
D878	8-719-404-46	DIODE	MA110

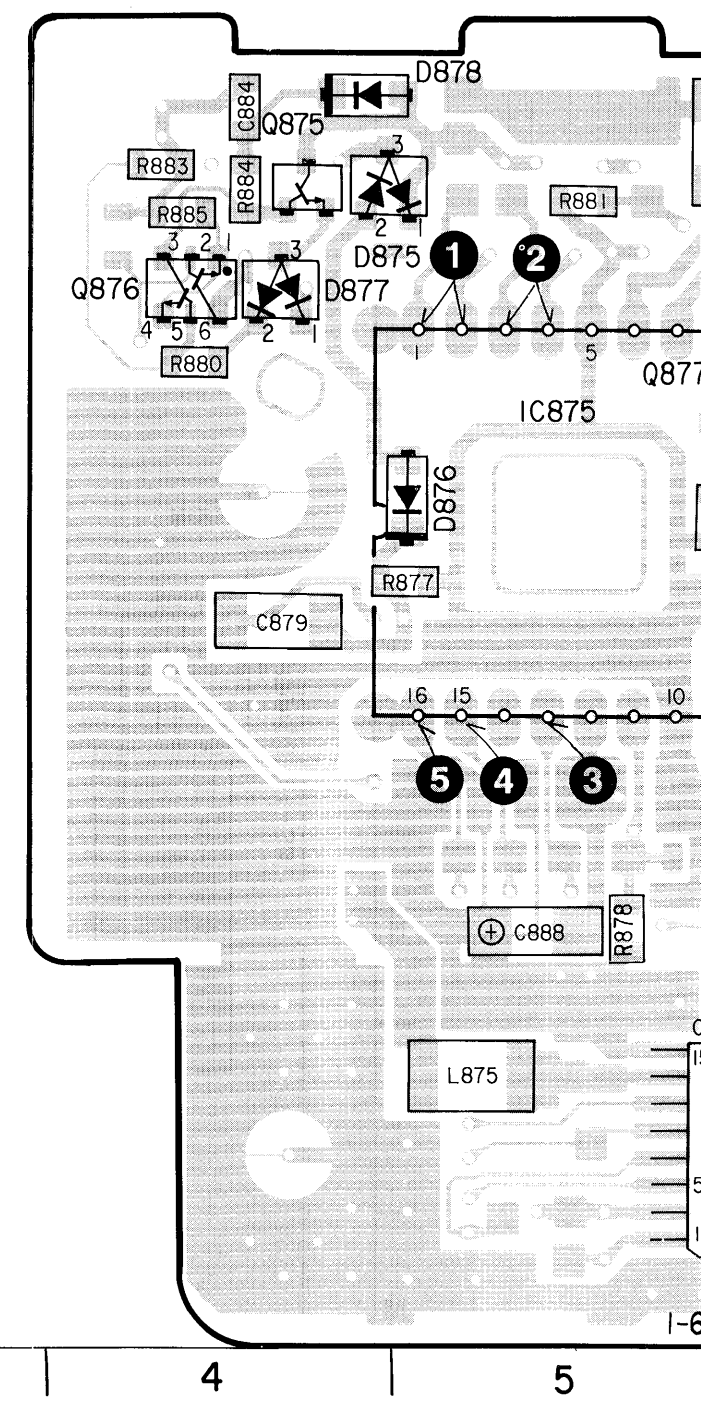
< TRANSISTOR >

Q875	8-729-425-64	TRANSISTOR	2SD2216Q
Q876	8-729-427-72	TRANSISTOR	XP4501
Q877	8-729-232-86	TRANSISTOR	2SK1875

CD-106 BOARD (COMPONENT SIDE)


A
B
C
D
C881
C877
C876
C882
C875
1-647-994-
11
09
1
2
3

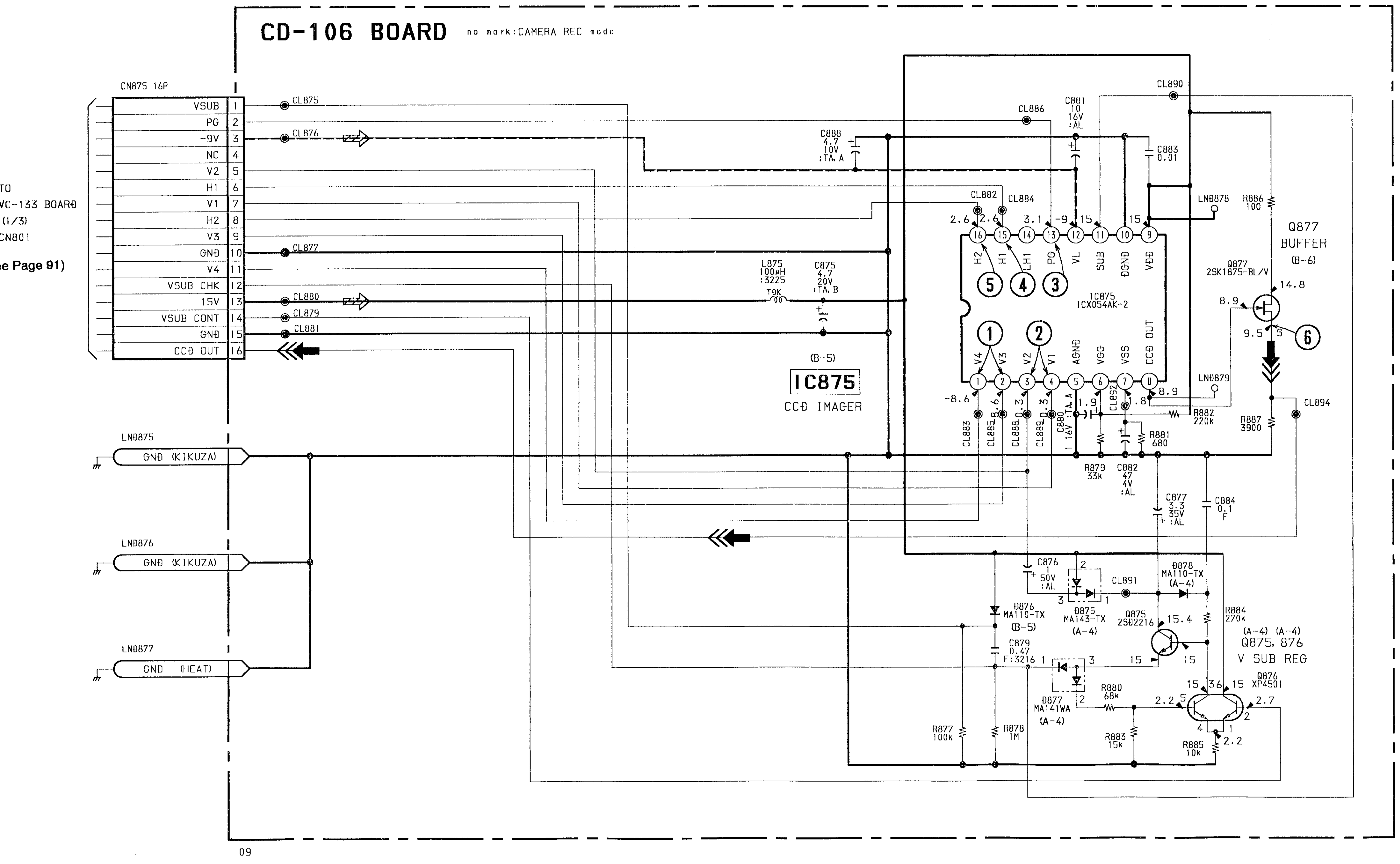
CD-106 BOARD (CONDUCTOR SIDE


D878
C884
Q875
R883
R884
R885
R881
D875
Q876
D877
R880
IC875
Q877
D876
R877
C679
16
15
10
C888
R878
L875
1-6
4
5

) SCHEMATIC DIAGRAM

2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22

D: 1000 series —


CD-106 BOARD
no mark:CAMERA REC mode
CN875 16P
VSUB 1
PG 2
-9V 3
NC 4
V2 5
H1 6
V1 7
H2 8
V3 9
GND 10
V4 11
VSUB CHK 12
15V 13
VSUB CONT 14
GND 15
CCD OUT 16
TO
VC-133 BOARD
(1/3)
CN801
ee Page 91)
CL875
CL876
CL877
CL880
CL879
CL881
LND875
GND (KIKUZA)
LND876
GND (KIKUZA)
LND877
GND (HEAT)
C888 4.7 10V :TA, A
L875 100μH :3225 TDK
C875 4.7 20V :TA, B
(B-5)
IC875
CCD IMAGER
CL886
C881 10 16V :AL
CL890
C883 0.01
CL882
CL884
IC875 ICX054AK-2
H2
H1
LH1
PG
VL
SUB
DGND
VDD
V4
V3
V2
V1
AGND
VGG
VSS
CCD OUT
LND878
R886 100
Q877
BUFFER
(B-6)
Q877 2SK1875-BL/V
LND879
R882 220k
R887 3900
CL894
CL883
CL885
CL888
CL889
C880 1 16V :TA, A
CL892
R881 680
R879 33k
C882 47 4V :AL
C877 3.3 35V :AL
C884 0.1 F
C876 1 50V :AL
CL891
D878 MA110-TX (A-4)
D876 MA110-TX (B-5)
D875 MA143-TX (A-4)
Q875 2SD2216
R884 270k
(A-4) (A-4)
Q875, 876
V SUB REG
C879 0.47 F:3216
D877 MA141WA (A-4)
R880 68k
Q876 XP4501
R877 100k
R878 1M
R883 15k
R885 10k
09

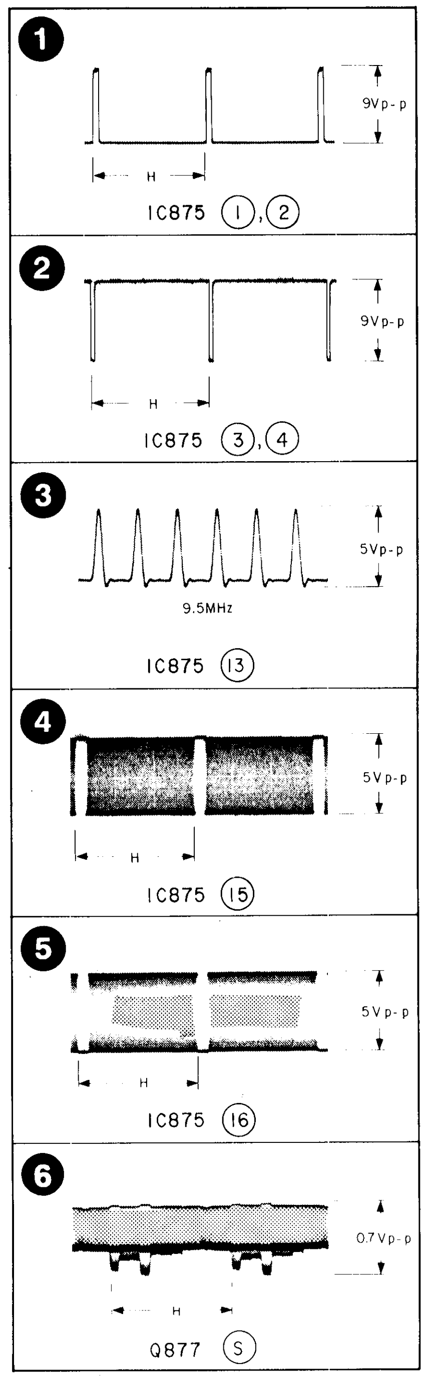
Note on the CCD imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-106 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on VC-133 board), and also written on the CCD data label put on the shield case (upper) of the DD-56 board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-106 board supplied as the repair parts.
  When replacing the CD-106 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

- **SIGNAL PATH**

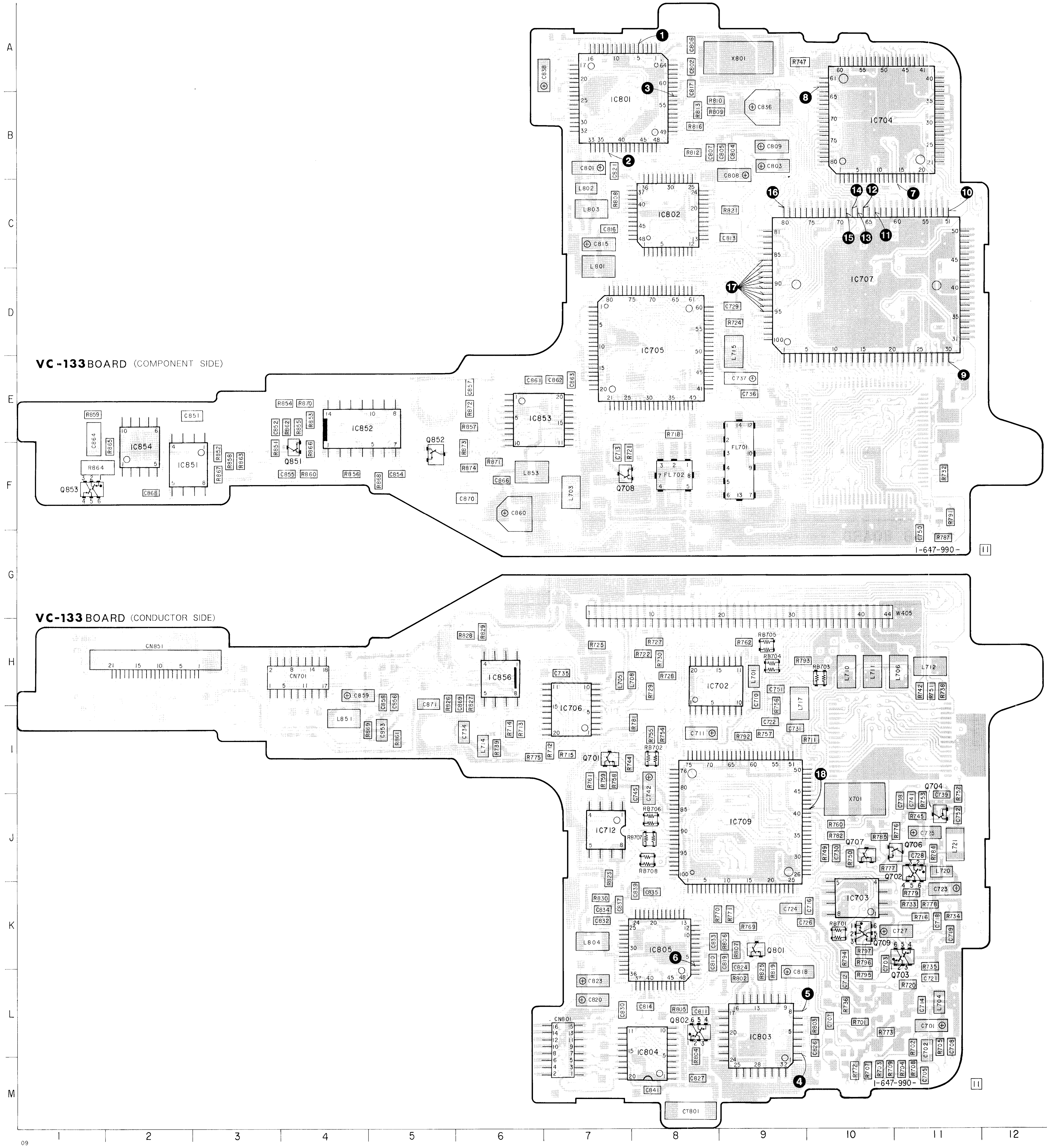
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》	
PB				

CD-106 BOARD



VC-133 (CAMERA, LENS DRIVE) PRINTED WIRING BOARD

— Ref. No. VC-133 BOARD: 3000 series —


VC-133 BOARD (COMPONENT SIDE)
VC-133 BOARD (CONDUCTOR SIDE)
IC801
IC802
IC704
IC707
IC705
IC853
IC852
IC854
IC851
FL701
FL702
Q851
Q852
Q853
Q708
IC856
CN701
CN851
IC706
IC702
IC709
IC712
IC703
IC805
IC804
IC803
CN801
CT801
X801
X701
W405
1-647-990-
11
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- **For printed wiring boards.**
- VC-133 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

< IC >

IC702	8-759-064-36	IC	MB88346BPFV
IC703	8-759-710-07	IC	NJM2234M
IC704	8-752-348-92	IC	CXD2101AR
IC705	8-759-063-18	IC	27C512-RCP-V1.0
IC706	8-752-355-56	IC	CXD2104BN
IC707	8-752-337-32	IC	CXD2100Q
IC709	8-752-840-64	IC	CXP80624-434R
IC712	8-759-073-67	IC	BR9021AF
IC801	8-752-350-16	IC	CXD1257AR
IC802	8-752-056-39	IC	CXA1507BR
IC803	8-752-053-26	IC	CXA1399Q
IC804	8-752-327-48	IC	CXD1250N
IC805	8-752-054-61	IC	CXA1390AR
IC851	8-759-701-24	IC	NJM3414M
IC852	8-759-998-96	IC	LM324D
IC853	8-759-058-47	IC	MPC1724VM
IC854	8-759-823-51	IC	LB1830M
IC856	8-759-998-98	IC	LM358D

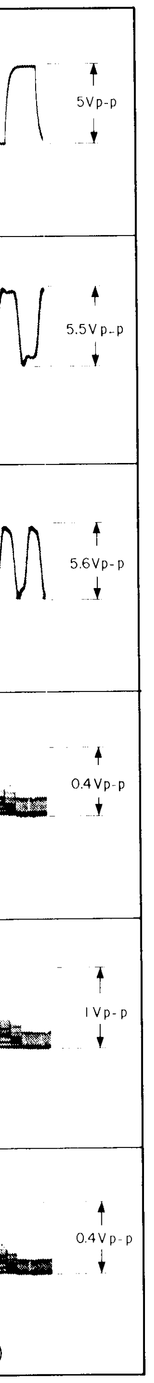
< TRANSISTOR >

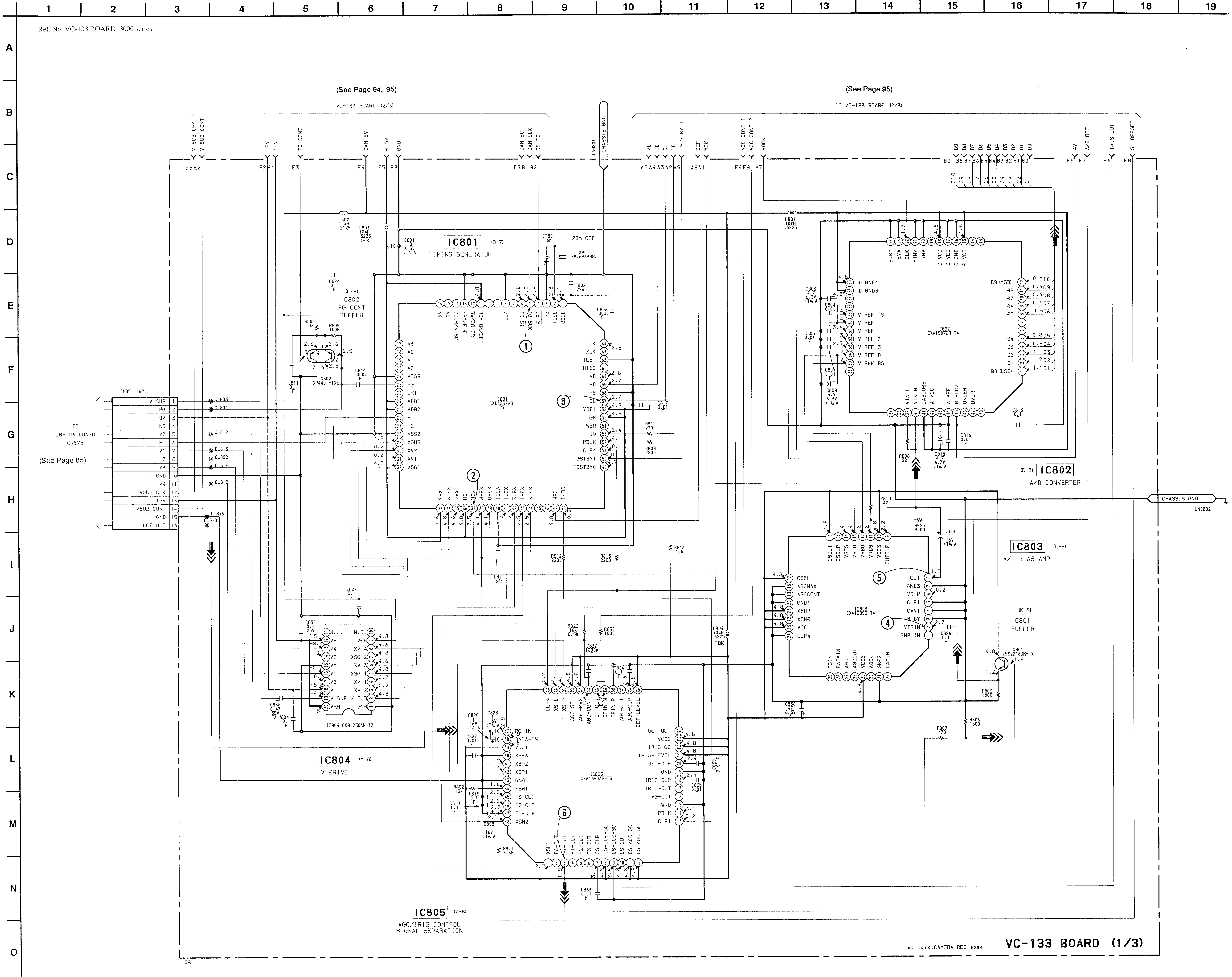
Q701	8-729-928-87	TRANSISTOR	DTC124EE
Q702	8-729-427-74	TRANSISTOR	XP4601
Q703	8-729-427-74	TRANSISTOR	XP4601
Q704	8-729-425-50	TRANSISTOR	2SB1462Q
Q706	8-729-425-64	TRANSISTOR	2SD2216Q
Q707	8-729-428-84	TRANSISTOR	UN9111
Q708	8-729-425-64	TRANSISTOR	2SD2216Q
Q709	8-729-427-72	TRANSISTOR	XP4501
Q801	8-729-425-64	TRANSISTOR	2SD2216Q
Q802	8-729-427-70	TRANSISTOR	XP4401
Q851	8-729-425-64	TRANSISTOR	2SD2216Q
Q852	8-729-013-88	TRANSISTOR	RN1302-TE85L
Q853	8-729-427-70	TRANSISTOR	XP4401

VC-133 (CAMERA) SCHEMATIC DIAGRAM

• Refer to page 88 for Printed Wiring Board.

SIGNAL	AUDIO SIGNAL
Y/CHROMA	





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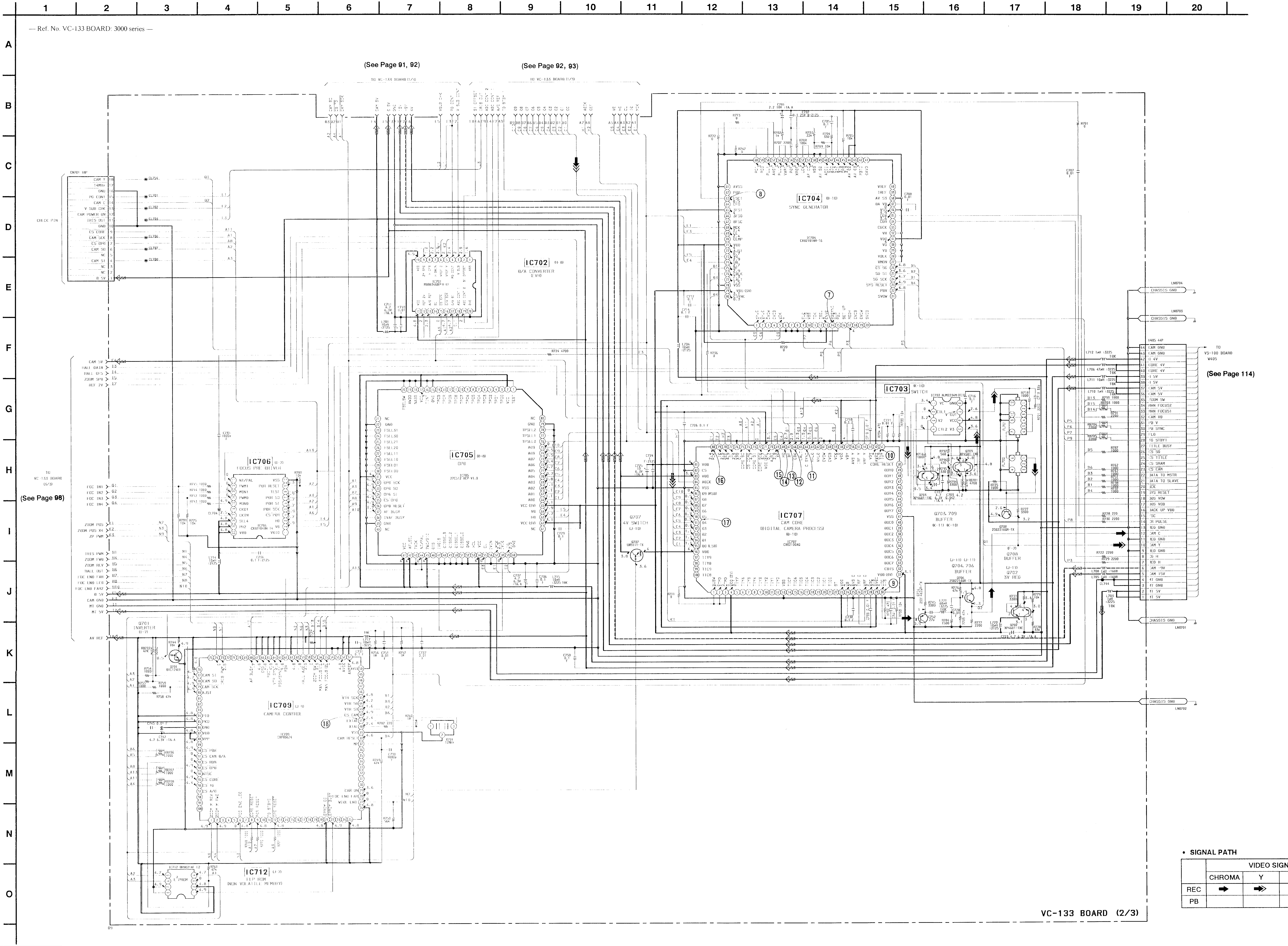
K
L
M
N
O
— Ref. No. VC-133 BOARD: 3000 series —
(See Page 94, 95)
VC-133 BOARD (2/3)
(See Page 95)
TO VC-133 BOARD (2/3)
CHASSIS GND
IC801 TIMING GENERATOR
CX61257AR
28M OSC
X801 28.6363MHz
Q802 PG CONT BUFFER
XP4401-TXE
IC802 A/D CONVERTER
CXA1507AR-T4
IC803 A/D BIAS AMP
CXA1399Q-T4
Q801 BUFFER
2SD2216QR-TX
IC804 V DRIVE
CX01250AN-T3
IC805 AGC/IRIS CONTROL SIGNAL SEPARATION
CXA1390AR-T3
CN801 16P
V SUB
PG
-9V
NC
V2
H1
V1
H2
V3
GND
V4
VSUB CHK
15V
VSUB CONT
GND
CCD OUT
TO CD-106 BOARD CN875
(See Page 85)
LND802
no mark:CAMERA REC mode
VC-133 BOARD (1/3)

VC-133 (CAMERA) SCHEMATIC DIAGRAM

• Refer to page 88 for Printed Wiring Board.

— Ref. No. VC-133 BOARD: 3000 series —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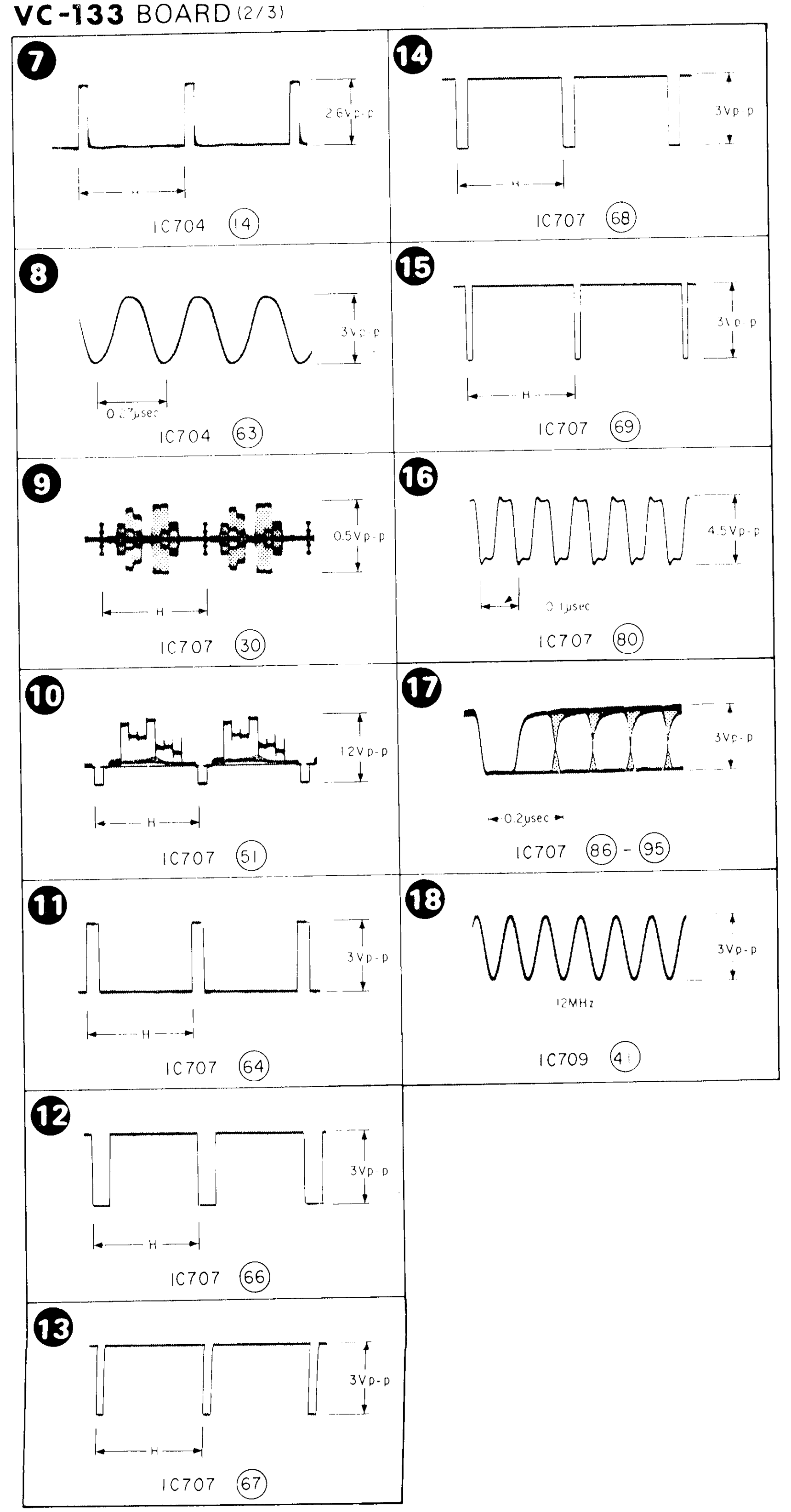
O
(See Page 91, 92)
(See Page 92, 93)
TO VC-133 BOARD (1/3)
CN701 18P
CHECK PIN
IC702
D/A CONVERTER
IC704
SYNC GENERATOR
IC703
SWITCH
IC705
DPB
IC706
FOCUS PRE DRIVER
IC707
CAM CORE
(DIGITAL CAMERA PROCESS)
IC709
CAMERA CONTROL
IC712
EEP ROM
(NON VOLATILE MEMORY)
Q701
INVERTER
Q707
4V SWITCH
Q703, 709
BUFFER
Q704, 706
BUFFER
Q708
BUFFER
Q702
5V REG
TO
VC-133 BOARD
(3/3)
(See Page 98)
TO
VS-100 BOARD
V405
(See Page 114)
V405 44P
CHASSIS GND
VC-133 BOARD (2/3)

• SIGNAL PATH

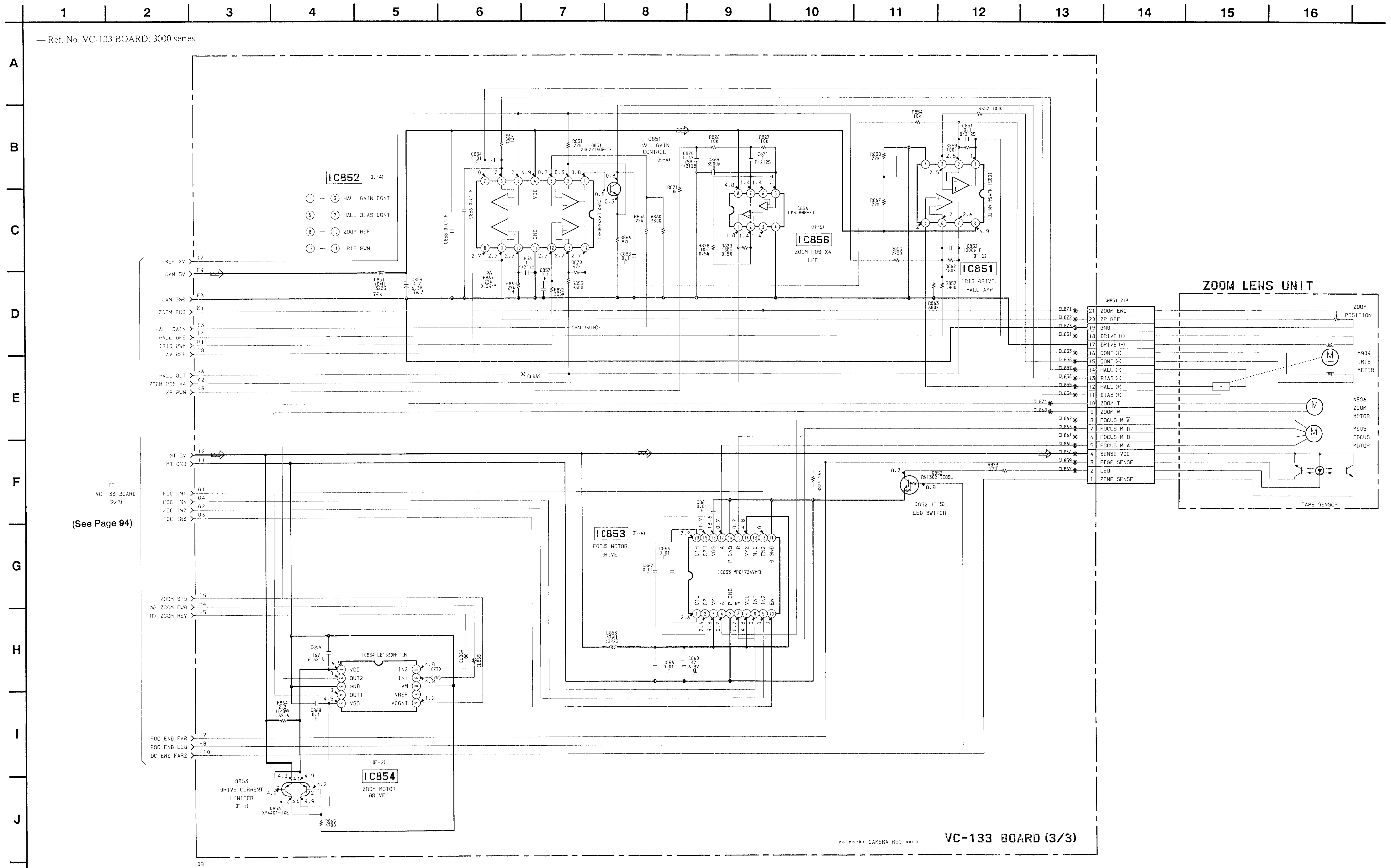
	VIDEO SIGN	
	CHROMA	Y
REC	➡	⇒
PB		

VC-133 BOARD (2/3)



VC-133 (LENS DRIVE) SCHEMATIC DIAGRAM

• Refer to page 88 for Printed Wiring Board.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
— Ref. No. VC-133 BOARD: 3000 series —
IC852 (E-4)
① — ③ HALL GAIN CONT
⑤ — ⑦ HALL BIAS CONT
⑧ — ⑩ ZOOM REF
⑫ — ⑭ IRIS PWM
IC852 LM324DR-E1
Q851 HALL GAIN CONTROL (F-4)
Q851 2SD2216QR-TX
IC856 LM358DR-E1
IC856 (H-6)
ZOOM POS X4 LPF
IC851 NJM3414M-TE1
IC851 (F-2)
IRIS DRIVE, HALL AMP
REF 2V
CAM 5V
CAM GND
ZOOM POS
HALL GAIN
HALL OFS
IRIS PWM
AV REF
HALL OUT
ZOOM POS X4
ZP PWM
MT 5V
MT GND
FOC IN1
FOC IN4
FOC IN2
FOC IN3
ZOOM SPD
(W) ZOOM FWD
(T) ZOOM REV
FOC END FAR
FOC END LED
FOC END FAR2
TO VC-133 BOARD (2/3)
<HALLGAIN>
CL869
IC853 (E-6)
FOCUS MOTOR DRIVE
IC853 MPC1724VMEL
IC854 LB1830M-TLM
IC854 (F-2)
ZOOM MOTOR DRIVE
Q853 DRIVE CURRENT LIMITER (F-1)
Q853 XP4401-TXE
Q852 RN1302-TE85L
Q852 (F-5) LED SWITCH
CN851 21P
21 ZOOM ENC
20 ZP REF
19 GND
18 DRIVE (+)
17 DRIVE (-)
16 CONT (+)
15 CONT (-)
14 HALL (-)
13 BIAS (-)
12 HALL (+)
11 BIAS (+)
10 ZOOM T
9 ZOOM W
8 FOCUS M A
7 FOCUS M B
6 FOCUS M B
5 FOCUS M A
4 SENSE VCC
3 EDGE SENSE
2 LED
1 ZONE SENSE
ZOOM LENS UNIT
ZOOM POSITION
M904 IRIS METER
N906 ZOOM MOTOR
M905 FOCUS MOTOR
TAPE SENSOR
no mark: CAMERA REC mode
VC-133 BOARD (3/3)
09

(See Page 94)

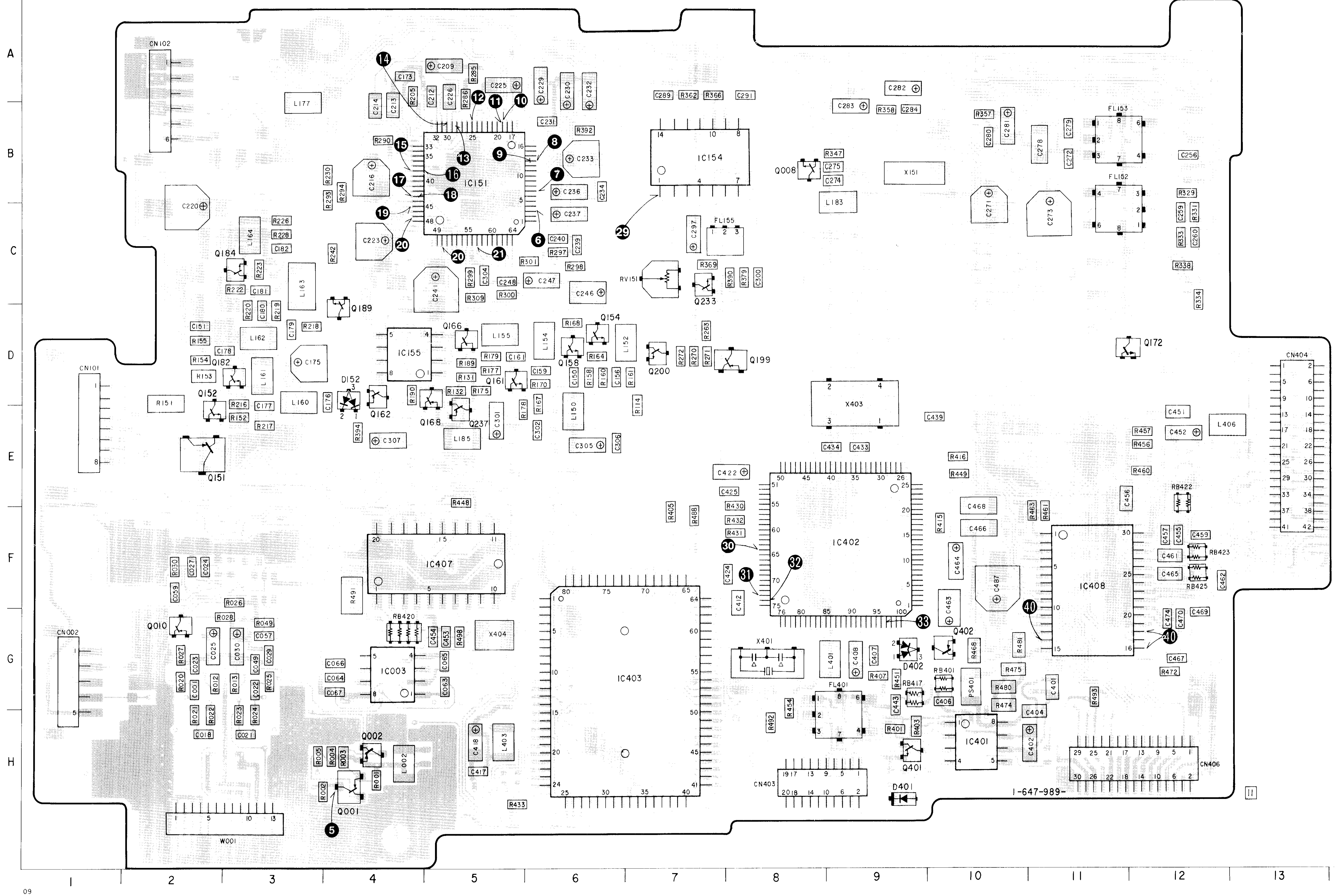
VS-100 (REC/PB HEAD AMP, VIDEO, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARD

— Ref. No. VS-100 BOARD: 4000 series —

- **For printed wiring boards.**
- VS-100 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:	Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
	Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

VS-100 BOARD (COMPONENT SIDE)


A
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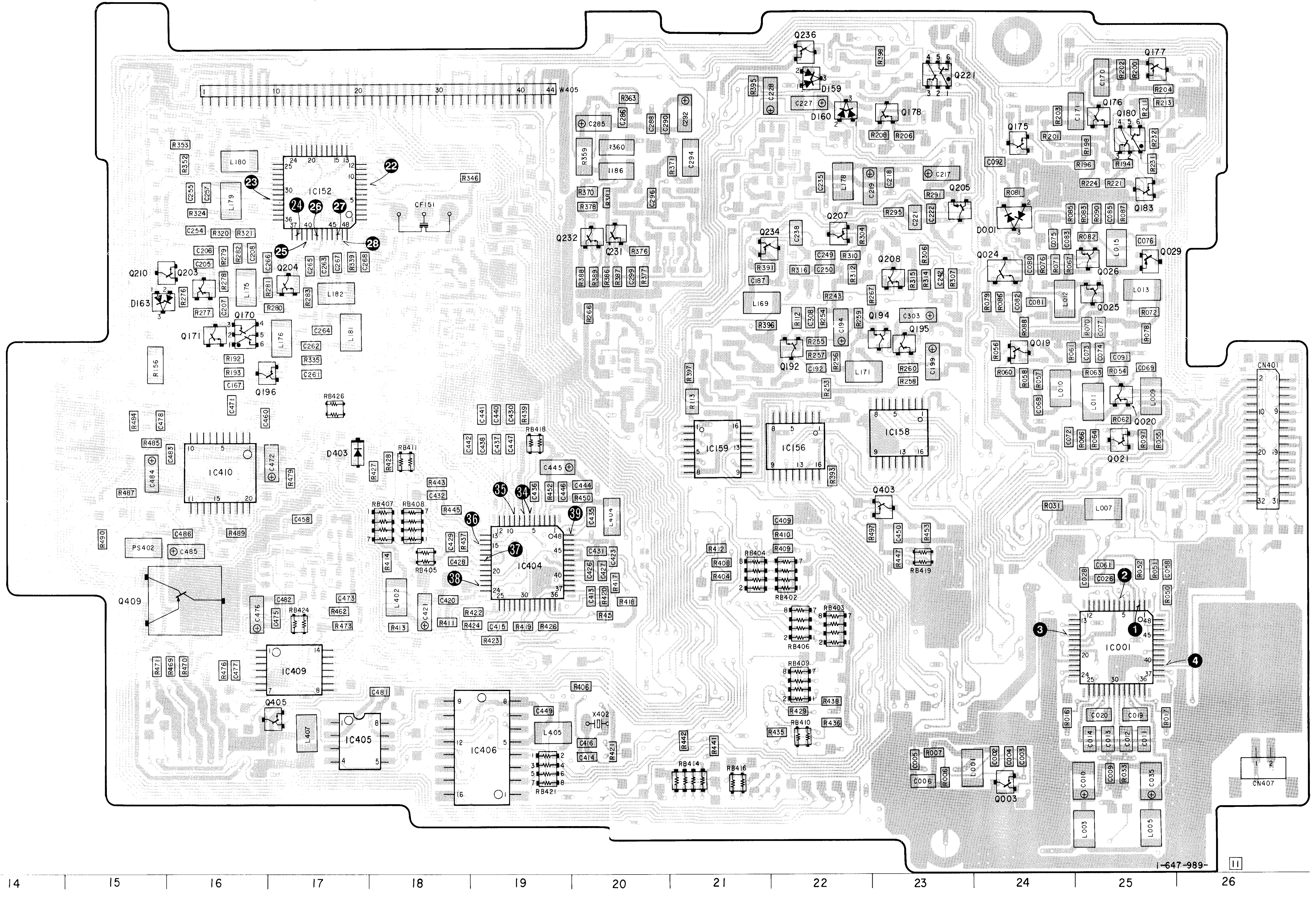
CN102
CN101
CN002
CN404
CN406
CN403
W001
IC151
IC154
IC155
IC407
IC003
IC403
IC402
IC408
IC401
X151
X403
X404
X401
1-647-989-
11

VS-100 BOARD (CONDUCTOR SIDE)


14
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24
25
26
W405
IC152
IC410
IC404
IC409
IC405
IC406
IC159
IC156
IC158
IC001
CN401
CN407
Q409
1-647-989-
11

: >

1SS226
MA142WA
MA142WK
MA142WK
MA142WK

MA728
MA142WK
MA110

XA1202R
XA1211M
XA1207AR
XA1208R
XL5502M

XA1211M
388347PFV-G-BND-ER
388346BPFV
XA1452N
-8420AF

XP80624-416R
PD75316GF-318-3B9
XA1481AR-E2
X6420F
PD6456GS-620

PD7564G-540
CD004BM
L1596CDB
PC1720VM

INK >

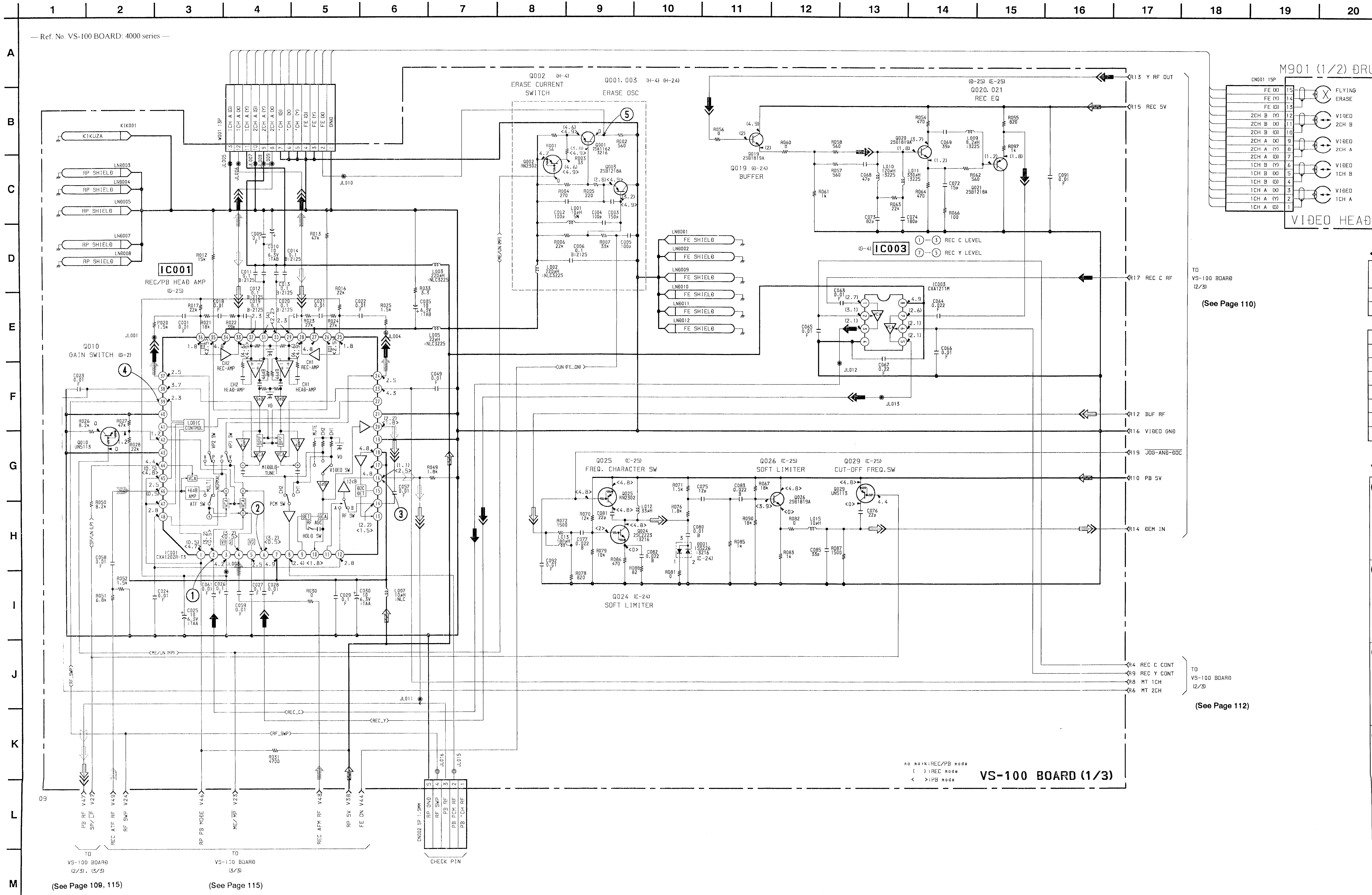
IC (CCP2E10 0.4A)
IC (CCP2E20 0.8A)

< TRANSISTOR >

Q001	8-729-216-22	TRANSISTOR	2SA1162-G
Q002	8-729-014-16	TRANSISTOR	RN2302-TE85L
Q003	8-729-402-55	TRANSISTOR	2SB1218A-R
Q008	8-729-402-32	TRANSISTOR	2SD1819A-R
Q010	8-729-403-35	TRANSISTOR	UN5113
Q019	8-729-402-32	TRANSISTOR	2SD1819A-R
Q020	8-729-402-32	TRANSISTOR	2SD1819A-R
Q021	8-729-402-55	TRANSISTOR	2SB1218A-R
Q024	8-729-102-07	TRANSISTOR	2SC2223-F13
Q025	8-729-014-16	TRANSISTOR	RN2302-TE85L
Q026	8-729-402-32	TRANSISTOR	2SD1819A-R
Q029	8-729-403-35	TRANSISTOR	UN5113
Q151	8-729-101-07	TRANSISTOR	2SB798-DL
Q152	8-729-402-32	TRANSISTOR	2SD1819A-R
Q154	8-729-402-32	TRANSISTOR	2SD1819A-R
Q158	8-729-402-32	TRANSISTOR	2SD1819A-R
Q161	8-729-402-32	TRANSISTOR	2SD1819A-R
Q162	8-729-403-35	TRANSISTOR	UN5113
Q166	8-729-402-55	TRANSISTOR	2SB1218A-R
Q168	8-729-403-35	TRANSISTOR	UN5113
Q170	8-729-420-20	TRANSISTOR	XN4312
Q171	8-729-117-73	TRANSISTOR	2SC4178-F14
Q172	8-729-117-73	TRANSISTOR	2SC4178-F14
Q175	8-729-402-32	TRANSISTOR	2SD1819A-R
Q176	8-729-402-32	TRANSISTOR	2SD1819A-R
Q177	8-729-402-55	TRANSISTOR	2SB1218A-R
Q178	8-729-402-55	TRANSISTOR	2SB1218A-R
Q180	8-729-422-54	TRANSISTOR	XN4215
Q182	8-729-402-32	TRANSISTOR	2SD1819A-R
Q183	8-729-420-53	TRANSISTOR	UN5115
Q184	8-729-402-32	TRANSISTOR	2SD1819A-R
Q189	8-729-402-32	TRANSISTOR	2SD1819A-R
Q192	8-729-402-32	TRANSISTOR	2SD1819A-R
Q194	8-729-402-32	TRANSISTOR	2SD1819A-R
Q195	8-729-402-55	TRANSISTOR	2SB1218A-R
Q196	8-729-403-35	TRANSISTOR	UN5113
Q199	8-729-807-87	TRANSISTOR	2SB1295-UL6
Q200	8-729-013-88	TRANSISTOR	RN1302-TE85L
Q203	8-729-402-55	TRANSISTOR	2SB1218A-R
Q204	8-729-402-32	TRANSISTOR	2SD1819A-R
Q205	8-729-402-42	TRANSISTOR	UN5213
Q207	8-729-403-35	TRANSISTOR	UN5113
Q208	8-729-013-88	TRANSISTOR	RN1302-TE85L
Q210	8-729-402-42	TRANSISTOR	UN5213
Q221	8-729-420-12	TRANSISTOR	XN4213
Q231	8-729-402-55	TRANSISTOR	2SB1218A-R
Q232	*8-729-402-32*	*TRANSISTOR*	*2SD1819A-R*
Q233	8-729-402-32	TRANSISTOR	2SD1819A-R
Q234	8-729-402-55	TRANSISTOR	2SB1218A-R
Q236	8-729-420-56	TRANSISTOR	UN511E
Q237	8-729-402-55	TRANSISTOR	2SB1218A-R
Q401	8-729-402-48	TRANSISTOR	UN521E
Q402	8-729-905-23	TRANSISTOR	2SA1576-R
Q403	8-729-403-35	TRANSISTOR	UN5113
Q405	8-729-013-88	TRANSISTOR	RN1302-TE85L
Q409	8-729-017-67	TRANSISTOR	2SB1574

VS-100 (REC/PB HEAD AMP) SCHEMATIC DIAGRAM

• Refer to page 101 for Printed Wiring Board.

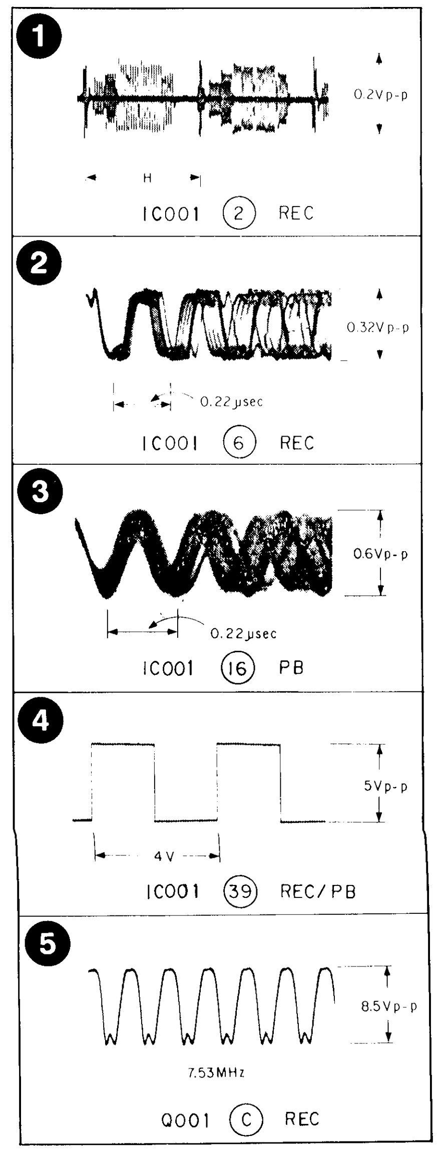

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
A B C D E F G H I J K L M
— Ref. No. VS-100 BOARD: 4000 series —
KIK001
KIKUZA
LN0003 RP SHIELD
LN0004 RP SHIELD
LN0005 RP SHIELD
LN0007 RP SHIELD
LN0008 RP SHIELD
IC001
REC/PB HEAD AMP
(G-2.5)
Q010
GAIN SWITCH (G-2)
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
ATF SW
PCM SW
MIDDLE TUNE
VIDEO SW
HOLD SW
RF SW
IC001 CXA1202R-T3
Q002 (H-4)
ERASE CURRENT SWITCH
Q001, 003 (H-4) (H-24)
ERASE OSC
(D-25) (E-25)
Q020, 021
REC EQ
Q019 (E-24)
BUFFER
IC003
CXA1211M
① REC C LEVEL
⑦ REC Y LEVEL
LN0001 FE SHIELD
LN0002 FE SHIELD
LN0009 FE SHIELD
LN0010 FE SHIELD
LN0011 FE SHIELD
LN0012 FE SHIELD
Q025 (E-25)
FREQ. CHARACTER SW
Q026 (E-25)
SOFT LIMITER
Q029 (E-25)
CUT-OFF FREQ. SW
Q024 (E-24)
SOFT LIMITER
R13 Y RF OUT
R15 REC 5V
R17 REC C RF
R12 BUF RF
R16 VIDEO GND
R19 JOG-ANG-GDE
R10 PB 5V
R14 GEM IN
R4 REC C CONT
R9 REC Y CONT
R8 MT 1CH
R6 MT 2CH
TO VS-100 BOARD (2/3)
(See Page 110)
TO VS-100 BOARD (2/3)
(See Page 112)
M901 (1/2) DRUM
CN001 15P
FE (X) 15
FE (Y) 14
FE (G) 13
2CH B (Y) 12
2CH B (X) 11
2CH B (G) 10
2CH A (X) 9
2CH A (Y) 8
2CH A (G) 7
1CH B (Y) 6
1CH B (X) 5
1CH B (G) 4
1CH A (X) 3
1CH A (Y) 2
1CH A (G) 1
FLYING ERASE
VIDEO 2CH B
VIDEO 2CH A
VIDEO 1CH B
VIDEO 1CH A
VIDEO HEAD
no mark:REC/PB mode
( ):REC mode
< >:PB mode
VS-100 BOARD (1/3)
PB RF
SP/LP
REC ATF RF
RF SWP
RP PB MODE
MZ/RP
REC AFM RF
PB 5V
FE ON
CN002 5P 1.5MM
CHECK PIN
TO VS-100 BOARD (2/3), (3/3)
(See Page 109, 115)
TO VS-100 BOARD (3/3)
(See Page 115)

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB		⇨»	⇨»»	⇨

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal	»		⊃

VS-100 BOARD (1/3)



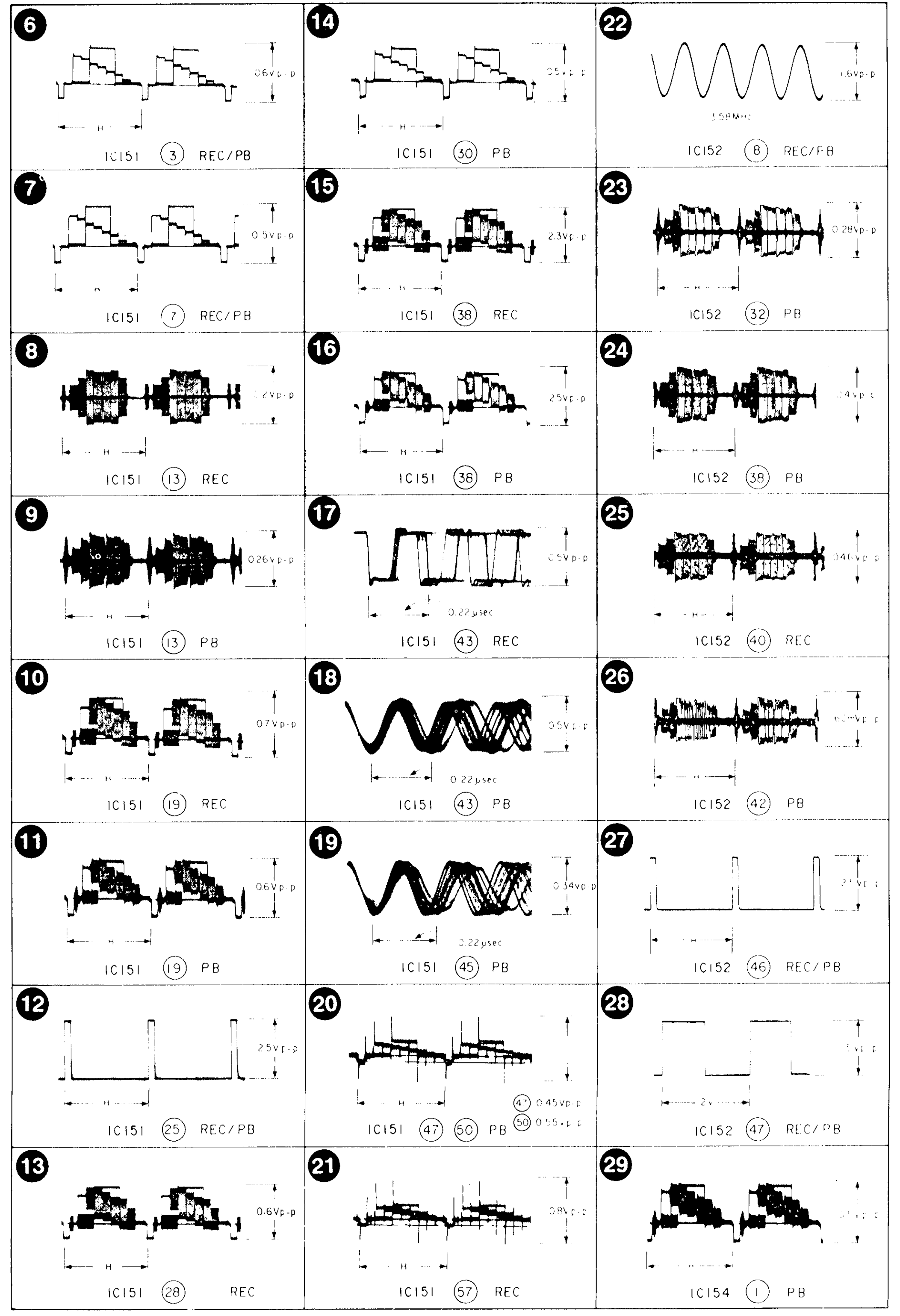
VS-100 (VIDEO) SCHEMATIC DIAGRAM

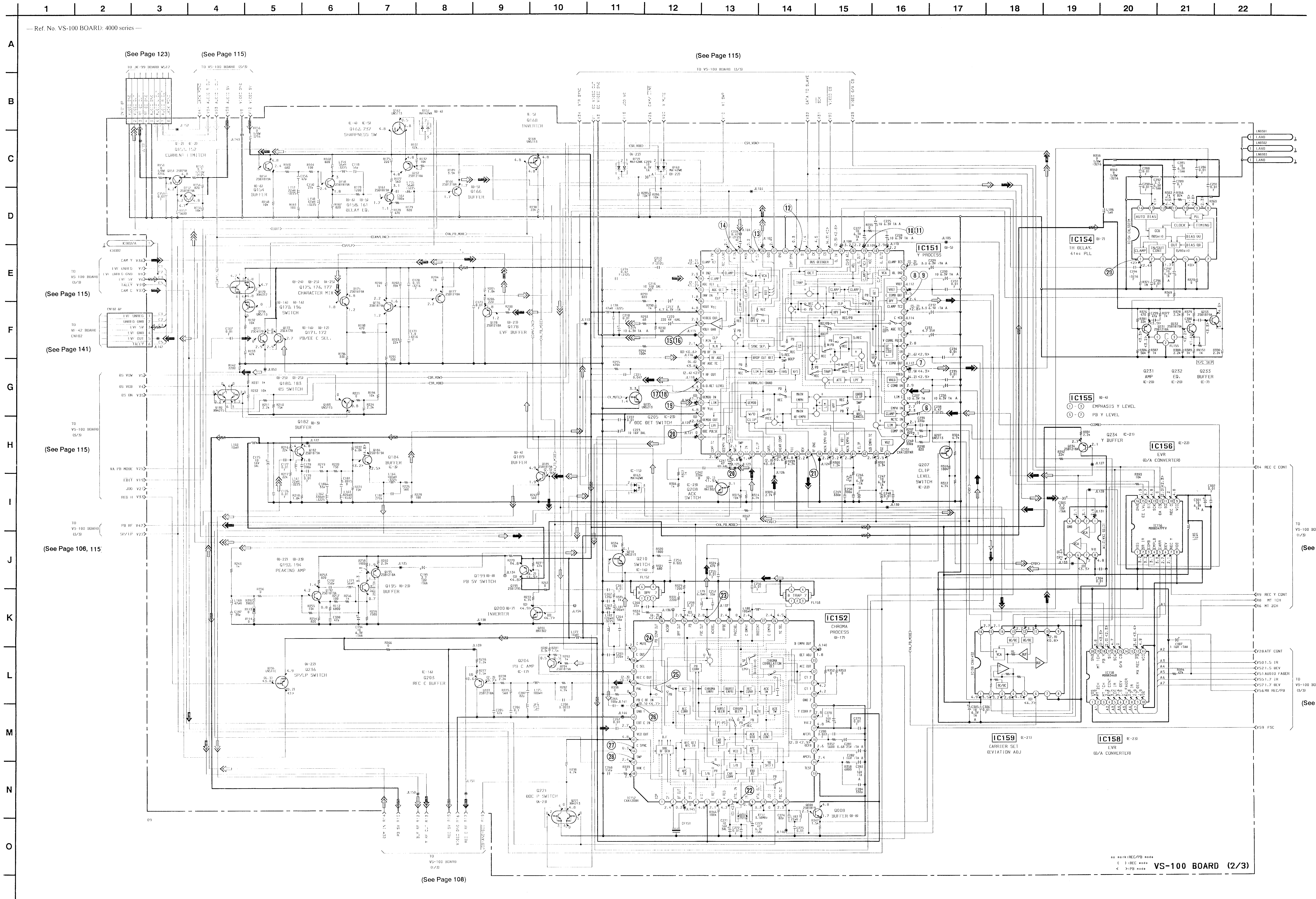
• Refer to page 101 for Printed Wiring Board.

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	
PB	⇨	⇨»	⇨⋙	⇨

VS-100 BOARD(2/3)

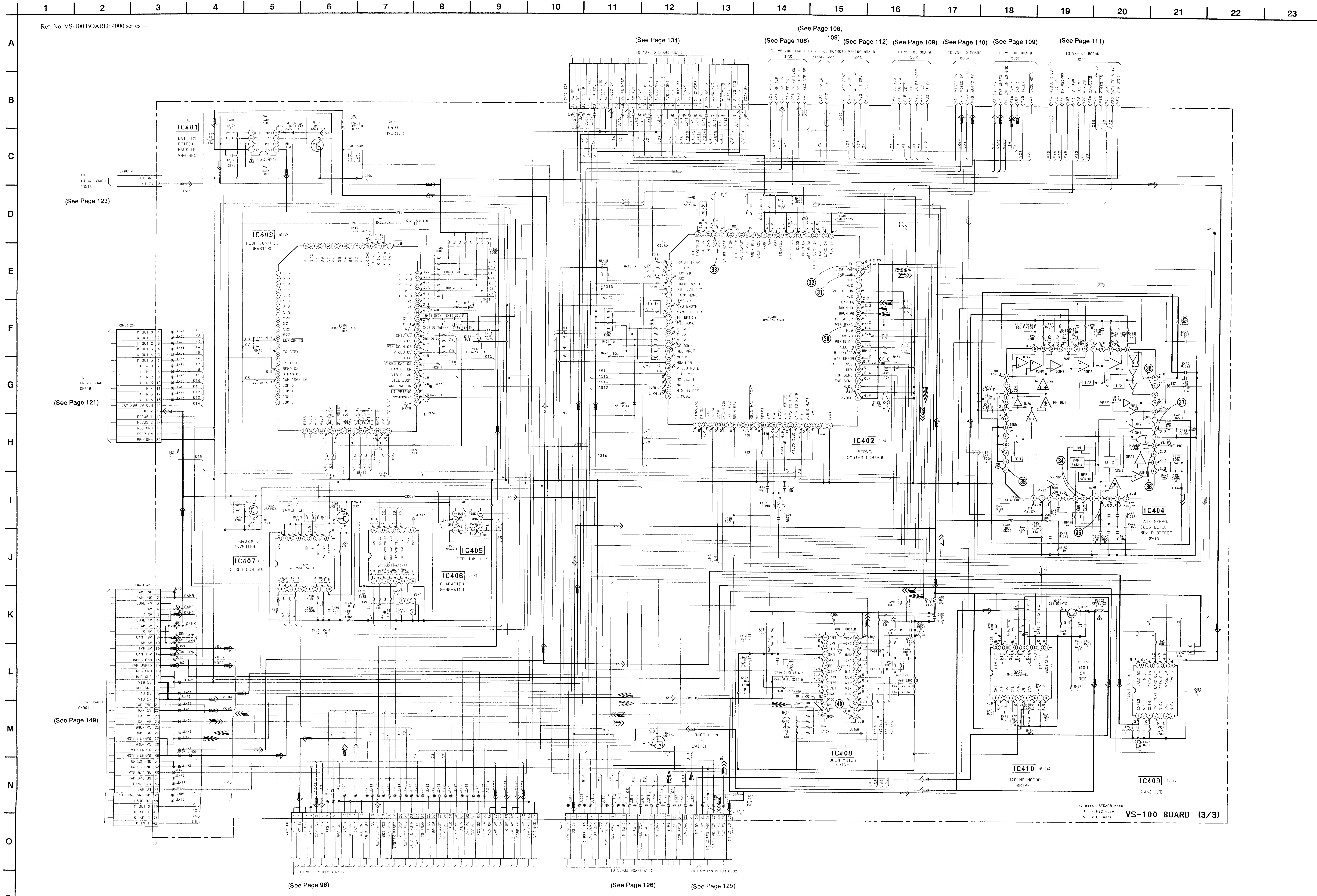




1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
A B C D E F G H I J K L M N O P
— Ref. No. VS-100 BOARD: 4000 series —
(See Page 123)
(See Page 115)
(See Page 115)
(See Page 115)
(See Page 141)
(See Page 115)
(See Page 106, 115)
(See Page 108)
(See Page
(See Page
Q162, 257 SHARPNESS SW
Q168 INVERTER
Q155, 157 CURRENT LIMITER
Q154 BUFFER
Q158, 161 DELAY EQ.
Q166 BUFFER
Q174, 176, 177 CHARACTER MIX
Q172, 156 SWITCH
Q171, 172 PB/EE C SEL.
Q178 EVF BUFFER
Q185, 183 ES SWITCH
Q182 BUFFER
Q184 BUFFER
Q189 BUFFER
Q192, 194 PEAKING AMP
Q195 BUFFER
Q199 PB 5V SWITCH
Q200 INVERTER
Q236 SP/LP SWITCH
Q203 REC C BUFFER
Q204 PB C AMP
Q205 DOC DET SWITCH
Q208 ACK SWITCH
Q207 CLIP LEVEL SWITCH
Q210 SWITCH
Q221 DOC P SWITCH
Q209 BUFFER
Q231 AMP
Q232 EQ.
Q233 BUFFER
Q234 Y BUFFER
IC151 Y PROCESS
IC152 CHROMA PROCESS
IC154 1H DELAY, 4fsc PLL
IC155 ①-④ EMPHASIS Y LEVEL ⑤-⑦ PB Y LEVEL
IC156 EVR (D/A CONVERTER)
IC158 EVR (D/A CONVERTER)
IC159 CARRIER SET DEVIATION ADJ
TO VS-100 BOARD (3/3)
TO VS-42 BOARD CN102
TO JK-99 BOARD
VS-100 BOARD (2/3)

VS-100 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

- Refer to page 101 for Printed Wiring Board.


— Ref. No. VS-100 BOARD: 4000 series —
IC401 BATTERY DETECT, BACK UP VDD REG
Q401 INVERTER
IC403 MODE CONTROL (MASTER)
IC402 SERVO SYSTEM CONTROL
IC404 ATF SERVO, CLOG DETECT, SP/LP DETECT
IC405 EEP ROM
IC406 CHARACTER GENERATOR
Q403 INVERTER
IC407 SIRCS CONTROL
Q405 LED SWITCH
IC408 DRUM MOTOR DRIVE
IC410 LOADING MOTOR DRIVE
Q409 5V REG
IC409 LANC I/O
(See Page 123)
(See Page 121)
(See Page 149)
(See Page 134)
(See Page 106)
(See Page 108, 109)
(See Page 112)
(See Page 109)
(See Page 110)
(See Page 109)
(See Page 111)
(See Page 98)
(See Page 126)
(See Page 125)
VS-100 BOARD (3/3)

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

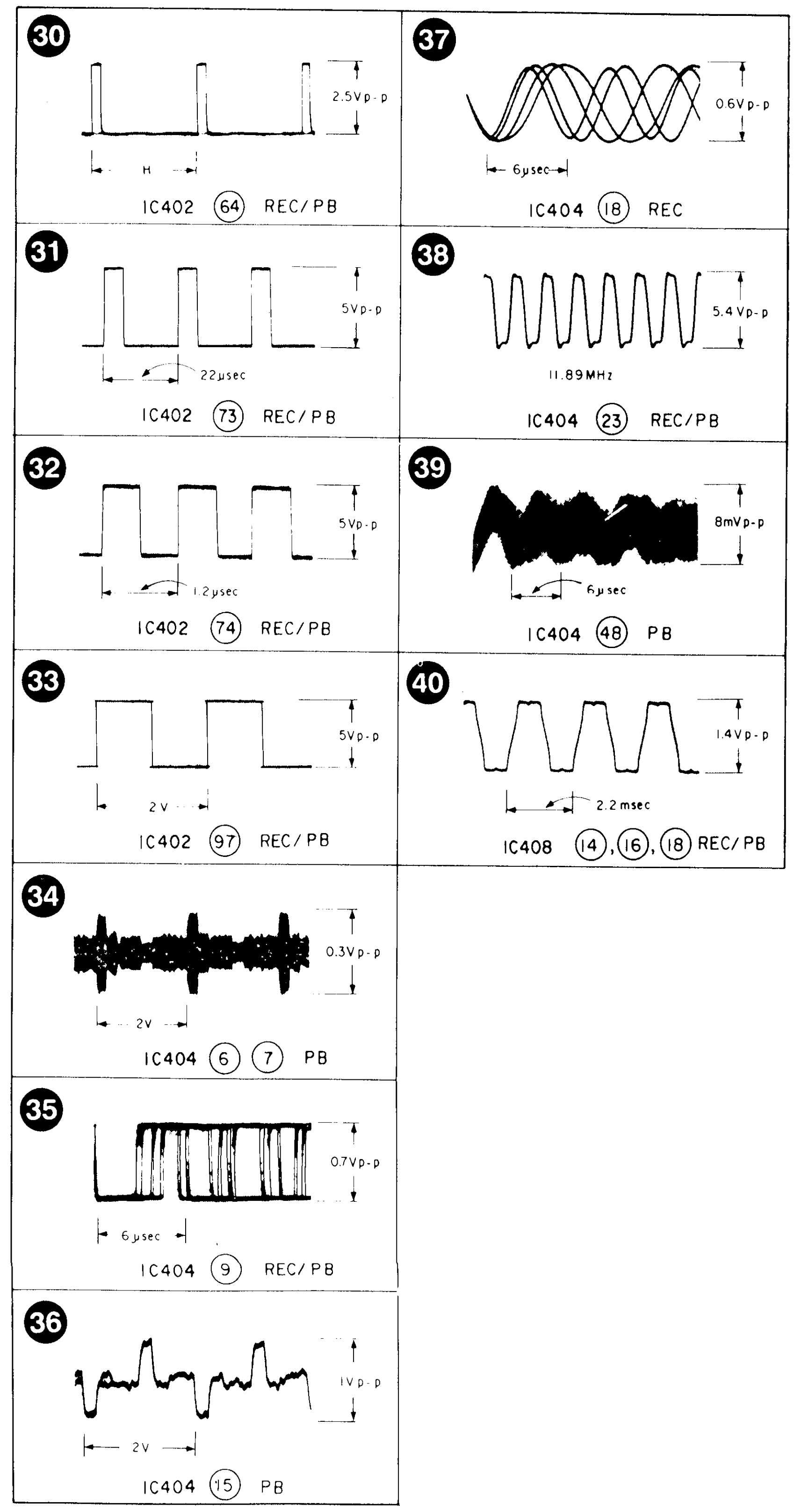
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)		⊳››	
Ref. signal	➧	➧	⇨

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»		➧
PB				⇨

VS-100 BOARD



CF-34 (CAMERA FUNCTION SWITCH), CN-73 (BOARD LINK), ED-37 (CAMERA FUNCTION SWITCH), MF-214 (MANUAL FOCUS SWITCH), VK-32 (VTR FUNCTION SWITCH), JK-99 (VIDEO/AUDIO JACK), LI-46 (LITHIUM BATTERY HOLDER) PRINTED WIRING BOARDS

— Ref. No. JK-99 BOARD: 3000 series, LI-46 BOARD: 4000 series, MF-214 BOARD: 5000 series, CN-73 BOARD: 6000 series, CF-34 BOARD: 7000 series, ED-37 BOARD: 8000 series, VK-32 BOARD: 9000 series —

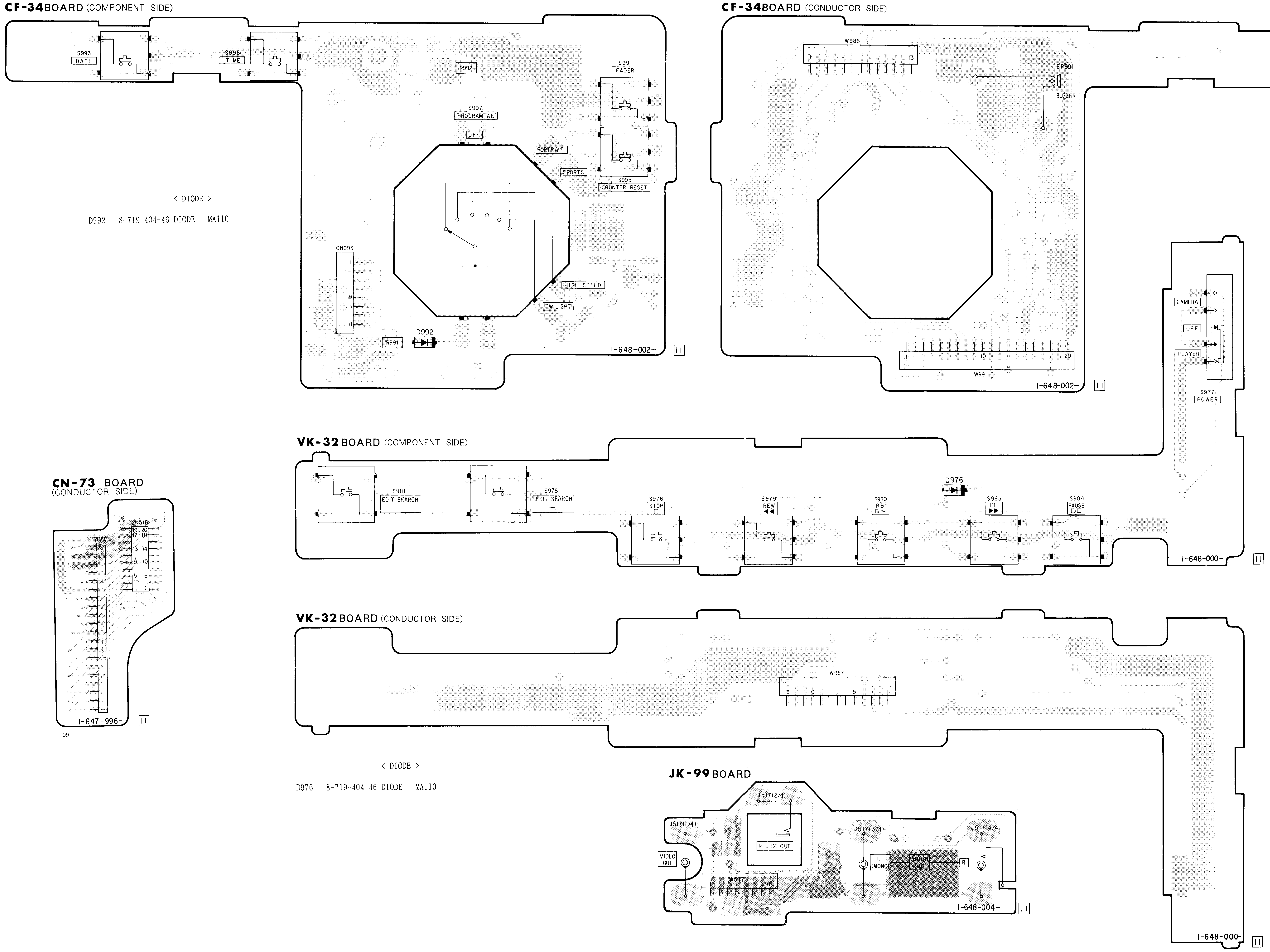
- **For printed wiring boards.**
- CF-34, ED-37, MF-214, VK-32 boards are the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- For printed wiring board of CN-73, LI-46 and JK-99 boards.
- ▨ : Pattern from the side which enables seeing.
- : Pattern of the rear side.

(The other layer's patterns are not indicated.)


CF-34 BOARD (COMPONENT SIDE)

CF-34 BOARD (CONDUCTOR SIDE)

CN-73 BOARD (CONDUCTOR SIDE)

VK-32 BOARD (COMPONENT SIDE)

VK-32 BOARD (CONDUCTOR SIDE)

JK-99 BOARD

S993
DATE
S996
TIME
R992
S991
FADER
S997
PROGRAM AE
OFF
PORTRAIT
SPORTS
S995
COUNTER RESET
CN993
1
5
8
HIGH SPEED
TWILIGHT
R991
D992
1-648-002-
11
W986
1
13
SP991
BUZZER
1
10
20
W991
1-648-002-
11
CAMERA
OFF
PLAYER
S977
POWER
CN518
19 20
17 18
13 14
9 10
5 6
1 2
W991
20
1-647-996-
11
09
S981
EDIT SEARCH +
S978
EDIT SEARCH −
S976
STOP □
S979
REW ◀◀
S980
PB ▷
D976
S983
FF ▶▶
S984
PAUSE
1-648-000-
11
W987
13
10
5
1
1-648-000-
11
J517(1/4)
VIDEO OUT
J517(2/4)
RFU DC OUT
W517
1
8
J517(3/4)
L (MONO)
AUDIO OUT
R
J517(4/4)
1-648-004-
11

< DIODE >

D992	8-719-404-46	DIODE	MA110

< DIODE >

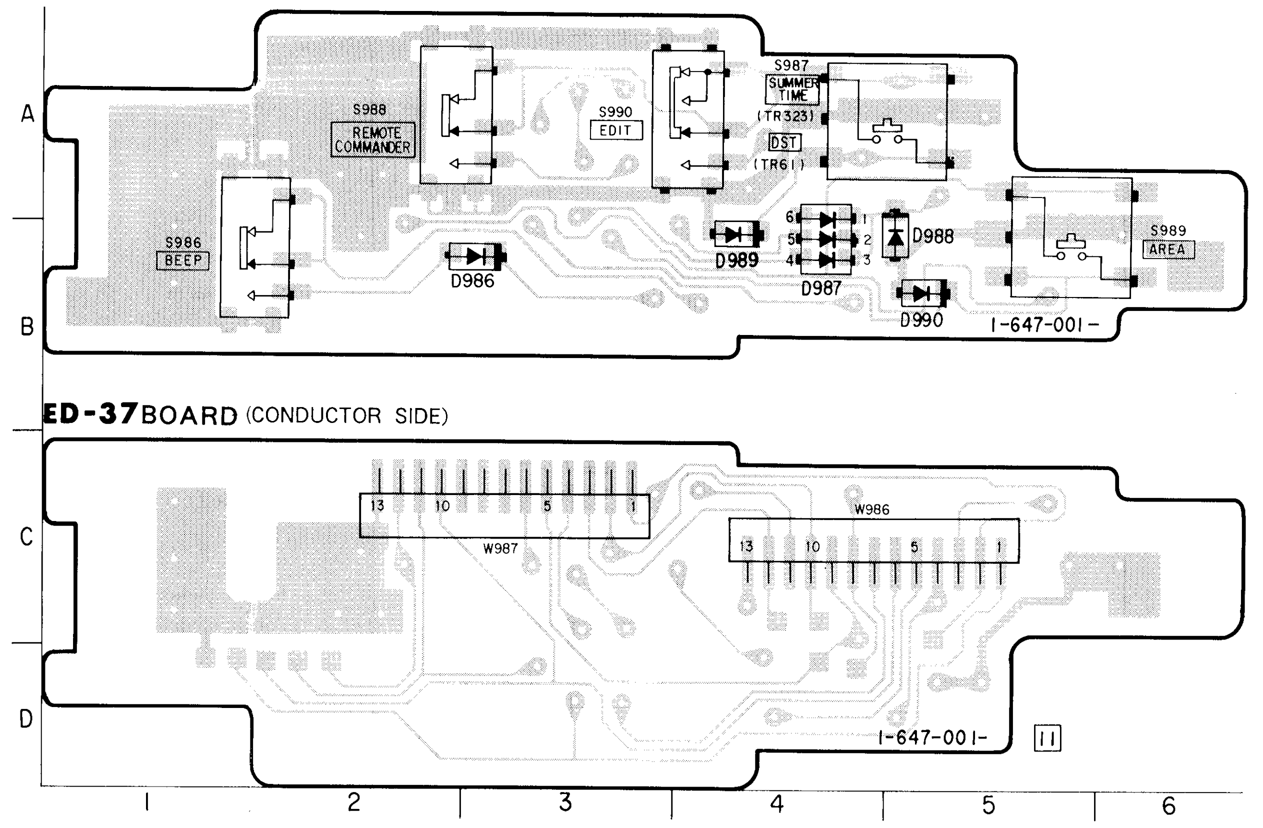
D976	8-719-404-46	DIODE	MA110

< DIODE >

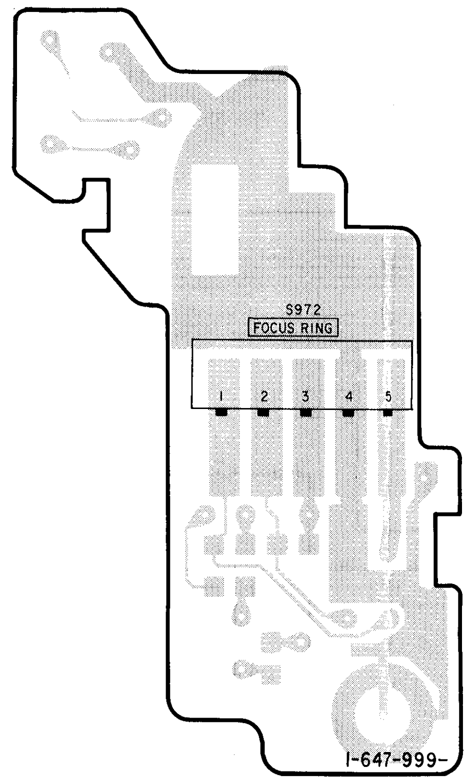
D986	8-719-404-46	DIODE	MA110
D987	8-719-404-40	DIODE	MA121
D988	8-719-420-14	DIODE	MA8082-M
D989	8-719-420-14	DIODE	MA8082-M
D990	8-719-420-14	DIODE	MA8082-M

ED-37 BOARD (COMPONENT SIDE)

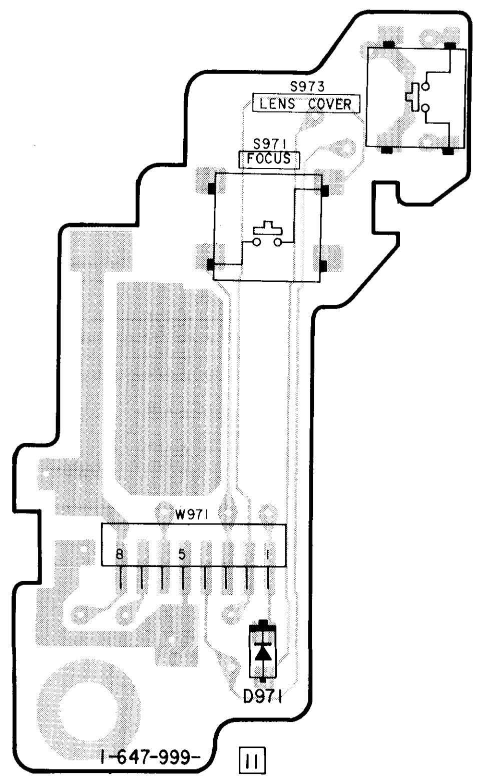
ED-37 BOARD (CONDUCTOR SIDE)


A
B
C
D
1
2
3
4
5
6
S988
REMOTE COMMANDER
S990
EDIT
S987
SUMMER TIME
(TR323)
DST
(TR61)
S986
BEEP
D986
D989
D987
D988
D990
S989
AREA
1-647-001-
13
10
5
1
W987
W986
1-647-001-
11

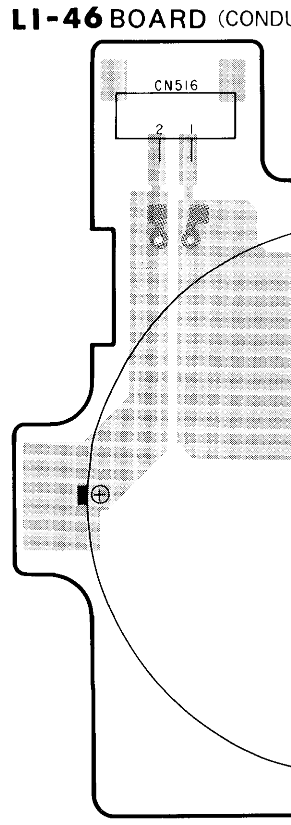
MF-214 BOARD (COMPONENT SIDE)


S972
FOCUS RING
1
2
3
4
5
1-647-999-
11

MF-214 BOARD (CONDUCTOR SIDE)


S973
LENS COVER
S971
FOCUS
W971
8
5
1
D971
1-647-999-
11

LI-46 BOARD (CONDU

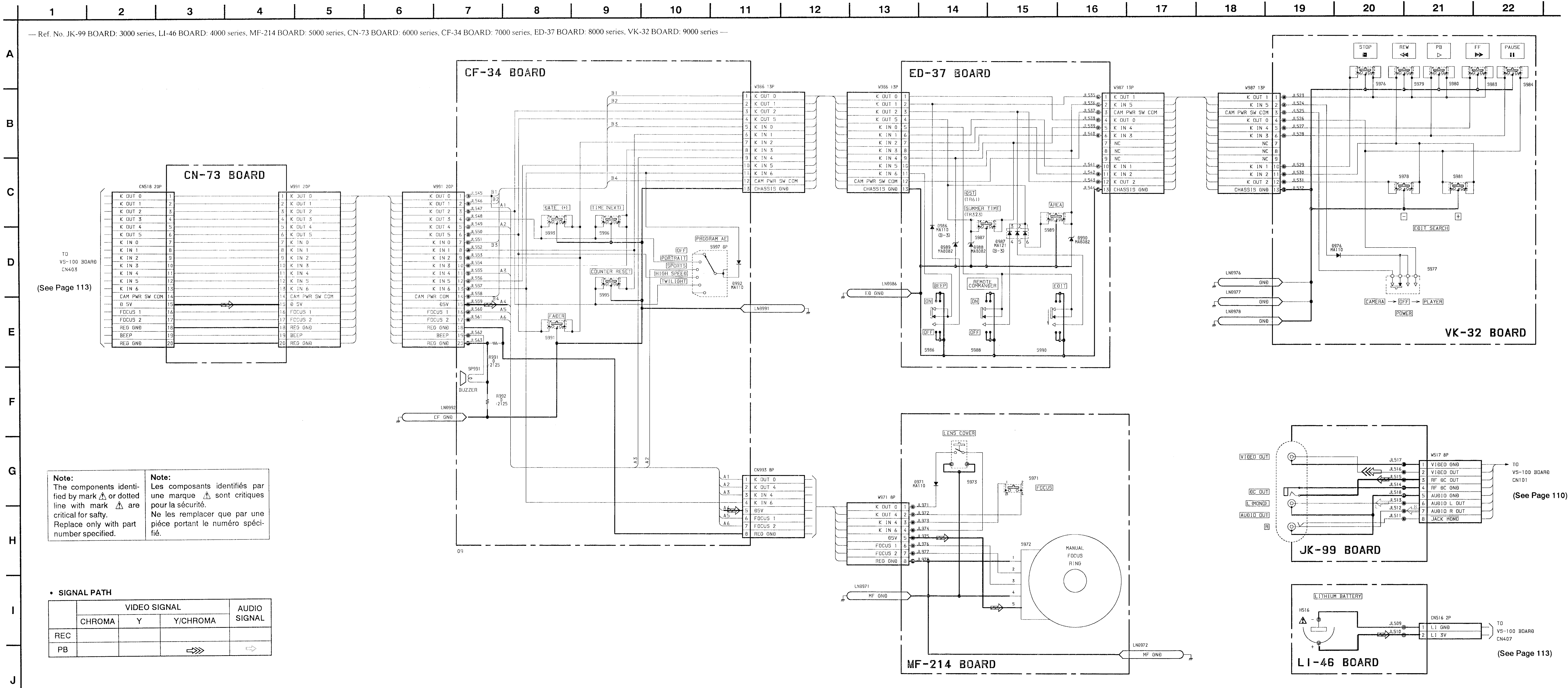


< DIODE >

D971	8-719-404-46	DIODE	MA110

CF-34 (CAMERA FUNCTION SWITCH), CN-73 (BOARD LINK), ED-37 (CAMERA FUNCTION SWITCH), MF-214 (MANUAL FOCUS SWITCH), VK-32 (VTR FUNCTION SWITCH), JK-99 (VIDEO/AUDIO JACK), LI-46 (LITHIUM BATTERY HOLDER) SCHEMATIC DIAGRAMS

— Ref. No. JK-99 BOARD: 3000 series, LI-46 BOARD: 4000 series, MF-214 BOARD: 5000 series, CN-73 BOARD: 6000 series, CF-34 BOARD: 7000 series, ED-37 BOARD: 8000 series, VK-32 BOARD: 9000 series —


1
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11
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14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J
CN-73 BOARD
CN518 20P
W991 20P
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
CAM PWR SW COM
8 5V
FOCUS 1
FOCUS 2
REG GND
BEEP
REG GND
TO VS-100 BOARD CN403
(See Page 113)
CF-34 BOARD
W986 13P
CAM PWR COM
CHASSIS GND
RATE (+)
TIME (NEXT)
PROGRAM AE
S997 6P
OFF
PORTRAIT
SPORTS
HIGH SPEED
TWILIGHT
D992 MA110
COUNTER RESET
FADER
S991
S993
S995
S996
SP991
BUZZER
R991
R992
LN0992
CF GND
LN0991
CN993 8P
05V
ED-37 BOARD
W987 13P
BST (TR61)
SUMMER TIME (TR323)
AREA
BEEP
REMOTE COMMANDER
EDIT
ON
OFF
S986
S987
S988
S989
S990
D986 MA110
D989 MA8082
D988 MA8082
D987 MA121
D990 MA8082
LN0986
ED GND
NC
VK-32 BOARD
STOP
REW
PB
FF
PAUSE
S976
S979
S980
S983
S984
S978
S981
EDIT SEARCH
D976 MA110
S977
CAMERA
OFF
PLAYER
POWER
LN0976
LN0977
LN0978
GND
MF-214 BOARD
W971 8P
LENS COVER
S973
S971
FOCUS
D971 MA110
S972
MANUAL FOCUS RING
LN0971
MF GND
LN0972
JK-99 BOARD
VIDEO OUT
DC OUT
L(MONO)
AUDIO OUT
R
W517 8P
VIDEO GND
VIDEO OUT
RF DC OUT
RF DC GND
AUDIO GND
AUDIO L OUT
AUDIO R OUT
JACK MONO
TO VS-100 BOARD CN101
(See Page 110)
LI-46 BOARD
LITHIUM BATTERY
H516
CN516 2P
LI GND
LI 3V
TO VS-100 BOARD CN407
(See Page 113)

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

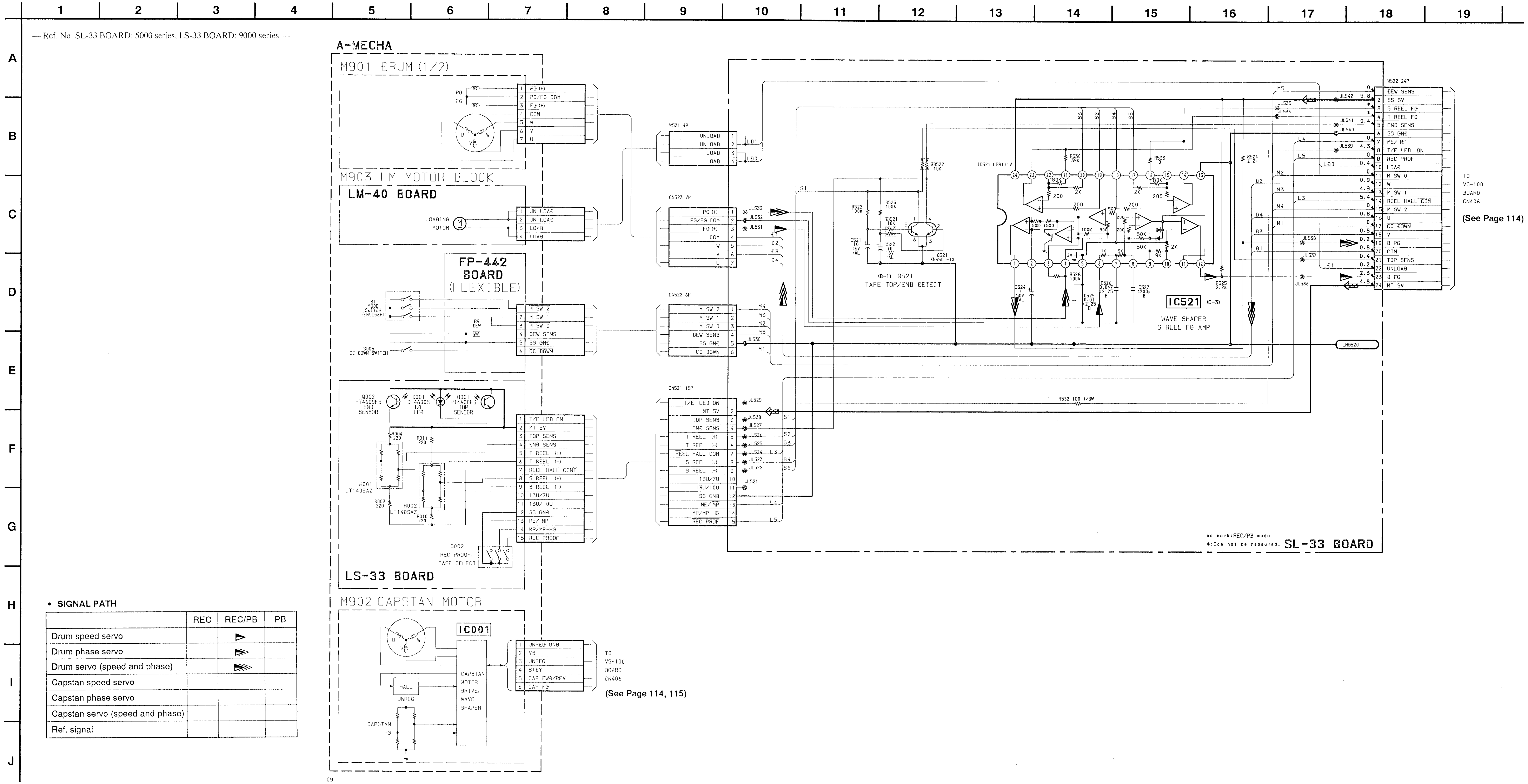
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB			⇨	⇨

SL-33 (FG/PG WAVEFORM SHAPING), FP-442 (MODE SWITCH), LM-40 (LOADING MOTOR), LS-33 (MECHA SENSOR) SCHEMATIC DIAGRAMS

— Ref. No. SL-33 BOARD: 5000 series, LS-33 BOARD: 9000 series —


1
2
3
4
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6
7
8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
A-MECHA
M901 DRUM (1/2)
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
M903 LM MOTOR BLOCK
LM-40 BOARD
LOADING MOTOR
UN LOAD
LOAD
FP-442 BOARD (FLEXIBLE)
S1 MODE SWITCH (ENCODER)
R9 DEW
S005 CC DOWN SWITCH
M SW 2
M SW 1
M SW 0
DEW SENS
SS GND
CC DOWN
Q002 PT4600FS END SENSOR
D001 GL4600S T/E LED
Q001 PT4600FS TOP SENSOR
H001 LT1405AZ
H002 LT1405AZ
T/E LED ON
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
13U/7U
13U/10U
ME/MP
MP/MP-HG
REC PROOF
S002 REC PROOF, TAPE SELECT
LS-33 BOARD
M902 CAPSTAN MOTOR
IC001
CAPSTAN MOTOR DRIVE, WAVE SHAPER
HALL
UNREG
CAPSTAN FG
UNREG GND
VS
UNREG
STBY
CAP FWD/REV
CAP FG
TO VS-100 BOARD CN406
(See Page 114, 115)
WS21 4P
CN523 7P
CN522 6P
CN521 15P
Q521 XN4501-TX
(B-1) Q521 TAPE TOP/END DETECT
IC521 LB8111V
IC521 (C-3)
WAVE SHAPER S REEL FG AMP
R532 100 1/8W
LND520
WS22 24P
DEW SENS
SS 5V
S REEL FG
T REEL FG
END SENS
SS GND
ME/MP
T/E LED ON
REC PROOF
LOAD
M SW 0
W
M SW 1
REEL HALL COM
M SW 2
U
CC DOWN
V
D PG
COM
TOP SENS
UNLOAD
D FG
MT 5V
TO VS-100 BOARD CN406
(See Page 114)
no mark:REC/PB mode
*:Can not be measured.
SL-33 BOARD
09

• **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal			

SL-33 (FG/PG WAVEFORM SHAPING), FP-442 (MODE SWITCH), LM-40 (LOADING MOTOR), LS-33 (MECHA SENSOR) PRINTED WIRING BOARDS

— Ref. No. SL-33 BOARD: 5000 series, LS-33 BOARD: 9000 series —

- FP-442, LM-40 boards are replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.

- **For printed wiring boards.**
- SL-33 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

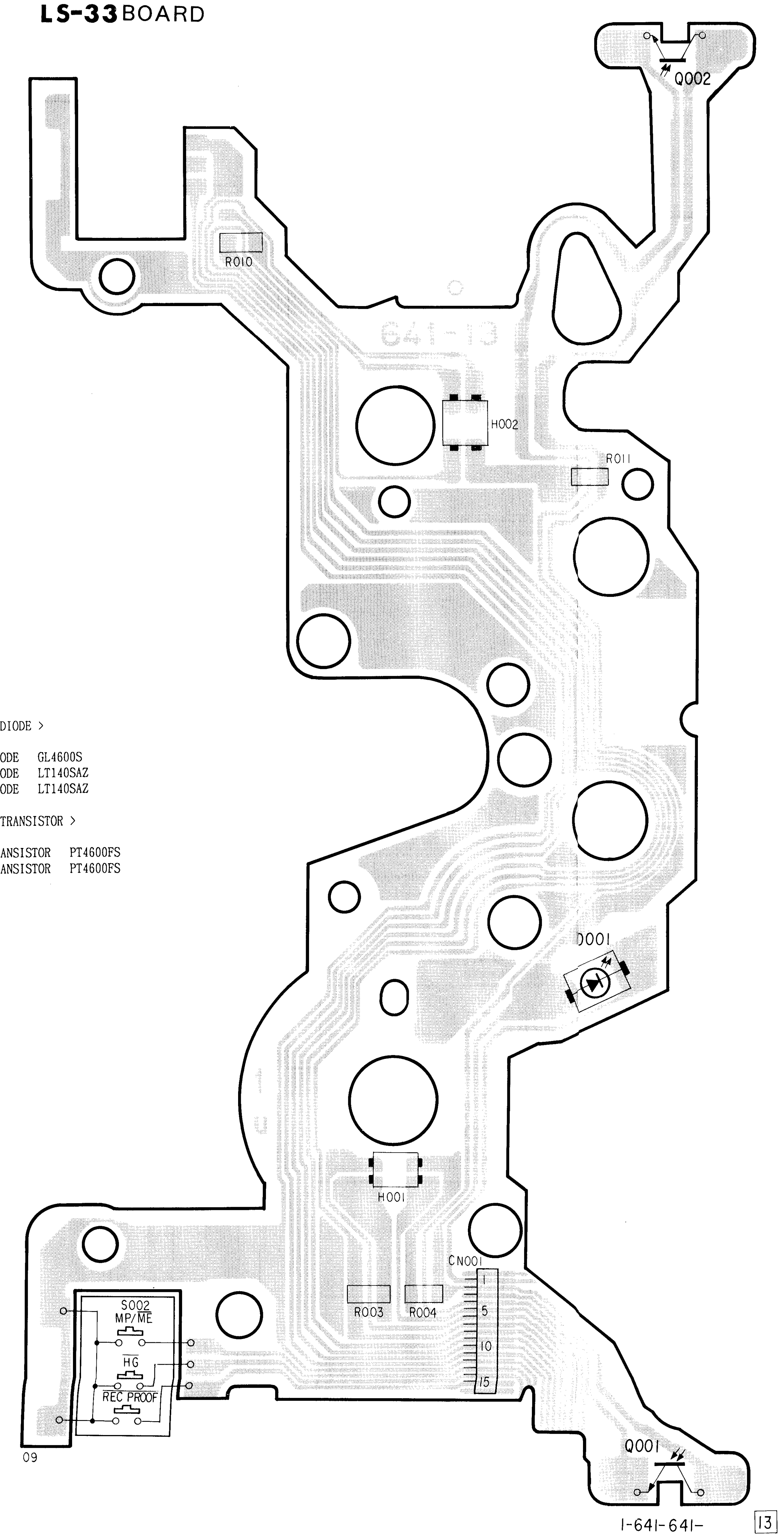
< IC >

IC521 8-759-059-09 IC LB8111V

< TRANSISTOR >

Q521 8-729-402-81 TRANSISTOR XN4501

LS-33 BOARD


Q002
R010
641-13
H002
R011
D001
H001
CN001
1
5
10
15
R003
R004
S002
MP/ME
HG
REC PROOF
09
Q001
1-641-641-
13

< DIODE >

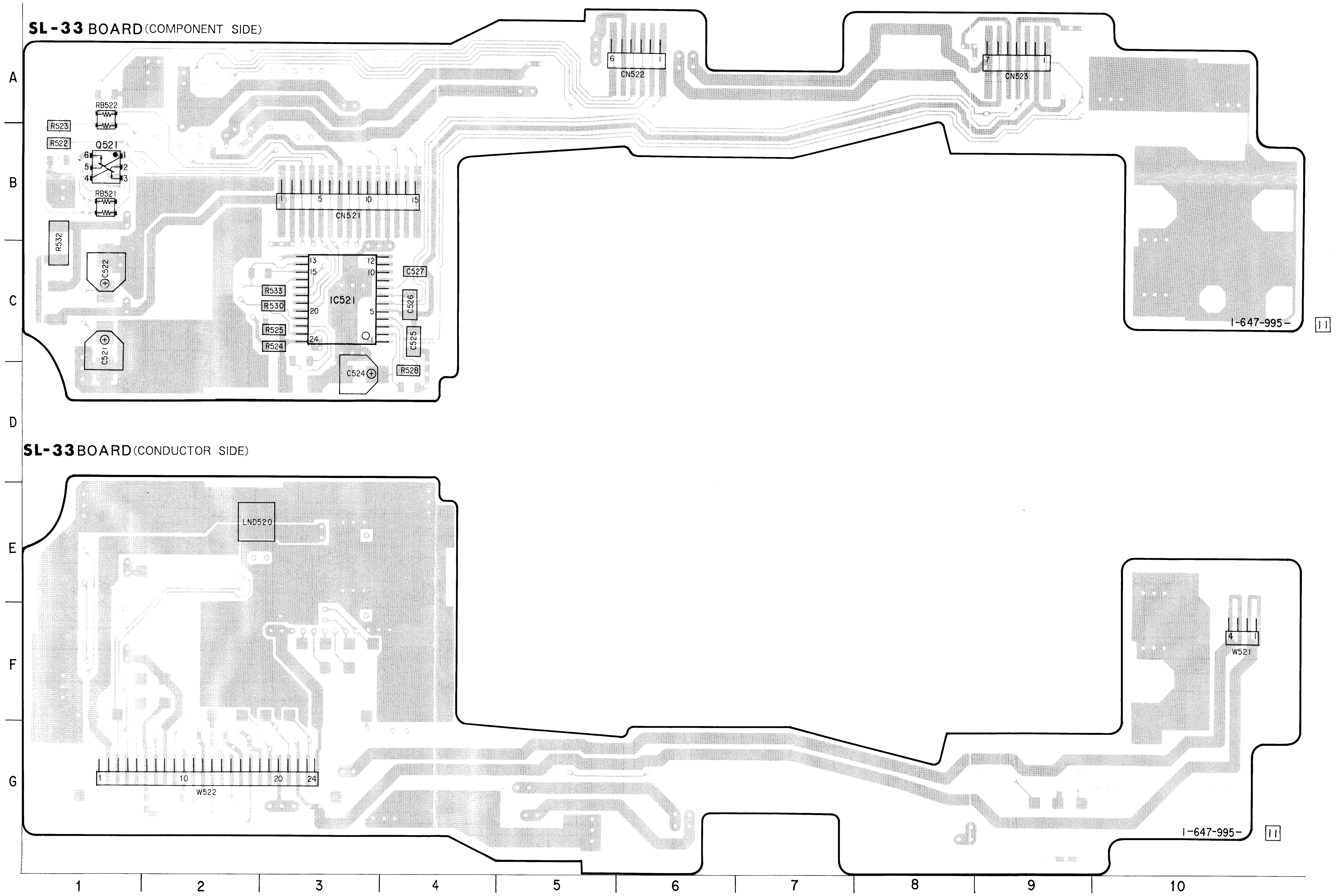
8-719-989-52 DIODE GL4600S
8-719-987-62 DIODE LT140SAZ
8-719-987-62 DIODE LT140SAZ

< TRANSISTOR >

8-729-012-46 TRANSISTOR PT4600FS
8-729-012-46 TRANSISTOR PT4600FS

SL-33 BOARD (COMPONENT SIDE)

SL-33 BOARD (CONDUCTOR SIDE)


A
B
C
D
E
F
G
R523
R522
RB522
Q521
6
5
4
1
2
3
RB521
R532
C522
C521
CN521
1
5
10
15
IC521
13
15
20
24
12
10
5
1
R533
R530
R525
R524
C527
C526
C525
C524
R528
CN522
6
1
CN523
7
1
1-647-995-
11
LND520
W521
4
1
W522
1
10
20
24
1-647-995-
11
1
2
3
4
5
6
7
8
9
10

AU-150 (STEREO AFM), MA-170 (MIC), WS-11 (WIDE ANGLE SWITCH) SCHEMATIC DIAGRAMS

— Ref. No. AU-150, MA-170, WS-11 BOARDS: 2000 series —

- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

MA-170 BOARD
IC551 MIC AMP
IC553 AUTO WIND
Q555 INT MIC MUTE
Q551 HI-FI SWITCH
INT MIC R
INT MIC L
PLUG IN POWER
CHASSIS GND
WS-11 BOARD
WIDE ANGLE
ZOOM SWITCH UNIT
AU-150 BOARD
IC601 1.5M AFM PROCESS
IC602 1.7M AFM PROCESS
IC603 MATRIX OUTPUT SELECT
IC604 SELECTOR
IC605 REMOTE CONTROL RECEIVER
Q601 BUFFER
Q603 1.5M RF AMP
Q604 1.7M RF AMP
Q605 MONO SW
Q606 AFM REC AMP
TO VS-100 CN401
no mark: CAMERA REC/PB mode.
( ): CAMERA REC mode.
< >: PB mode.

AU-150 (STEREO AFM), MA-170 (MIC), WS-11 (WIDE ANGLE SWITCH) PRINTED WIRING BOARDS

— Ref. No. AU-150, MA-170, WS-11 BOARDS: 2000 series —

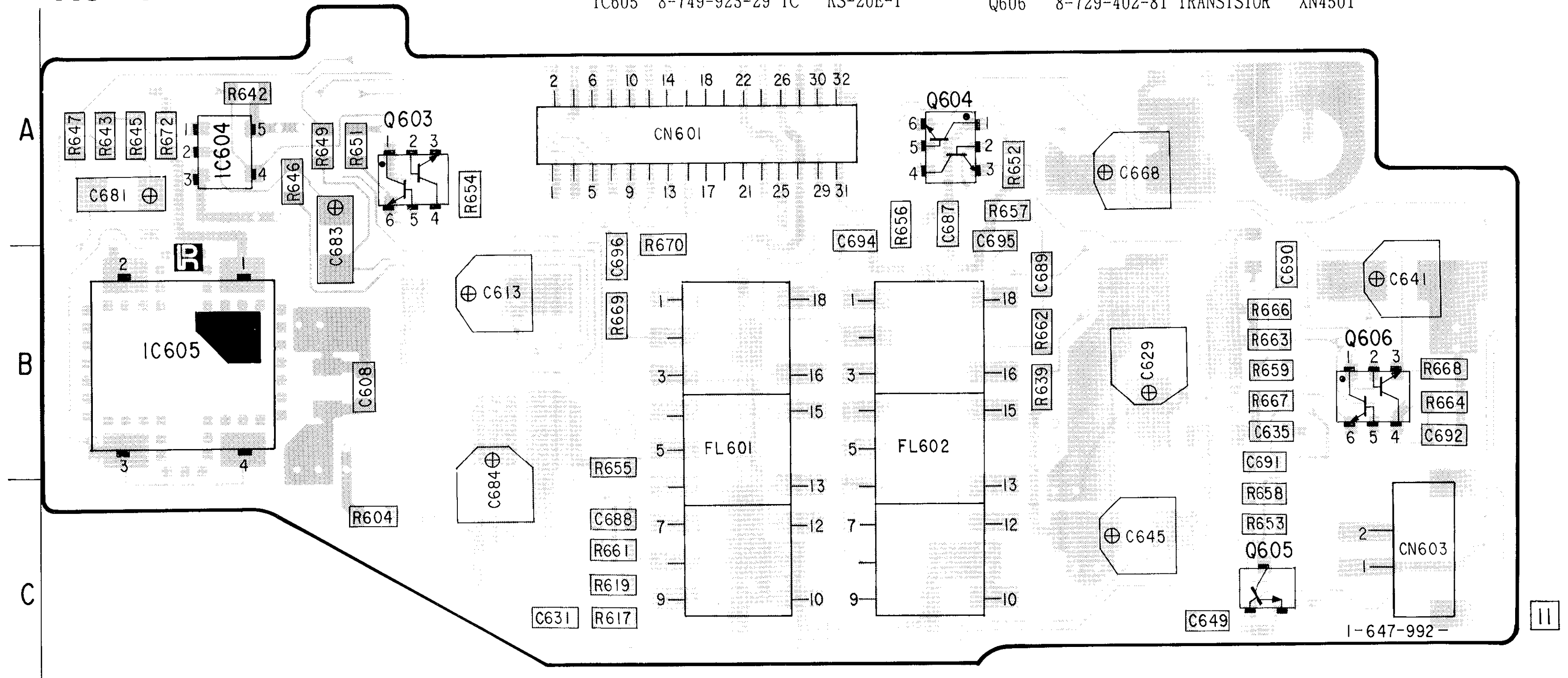
< IC >

IC601	8-759-823-19	IC	CXA1488R
IC602	8-759-823-19	IC	CXA1488R
IC603	8-759-823-21	IC	CXA1536Q
IC604	8-759-062-66	IC	TC7S66F
IC605	8-749-923-29	IC	RS-20E-T

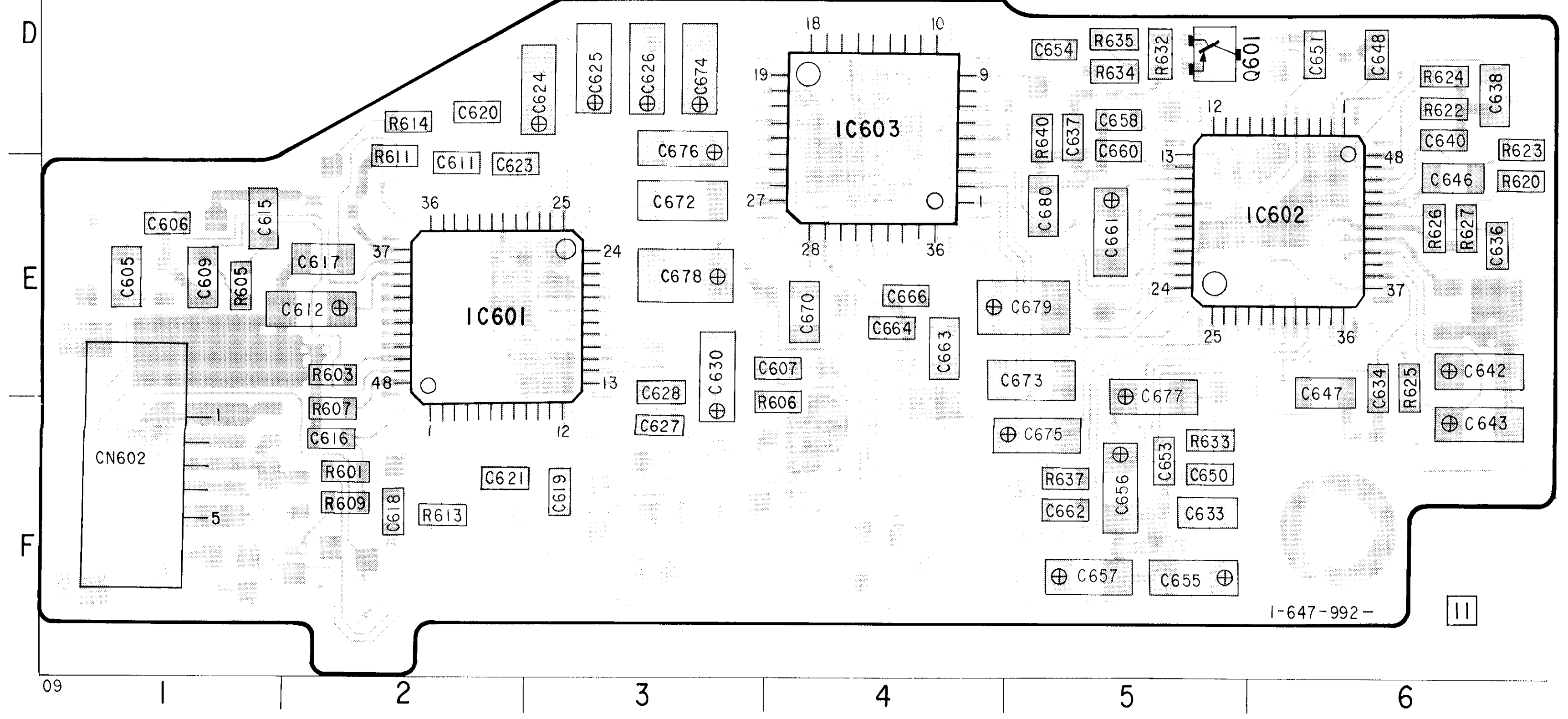
< TRANSISTOR >

Q601	8-729-823-00	TRANSISTOR	2SA1622-5. 6. 7
Q603	8-729-402-81	TRANSISTOR	XN4501
Q604	8-729-402-81	TRANSISTOR	XN4501
Q605	8-729-905-18	TRANSISTOR	DTC144EU
Q606	8-729-402-81	TRANSISTOR	XN4501

AU-150 BOARD (COMPONENT SIDE)


A
B
C
R647
R643
R645
R672
R642
IC604
R646
R649
R651
Q603
R654
C681
C683
CN601
Q604
R652
C668
R656
C687
R657
C694
C695
R670
C696
C613
R669
IC605
C608
FL601
FL602
C689
R662
R639
C629
C690
C641
R666
R663
R659
R667
C635
C691
R658
R653
Q606
R668
R664
C692
C684
R655
C688
R661
R619
C631
R617
R604
C645
Q605
C649
CN603
1-647-992-
11

AU-150 BOARD (CONDUCTOR SIDE)


D
E
F
C624
C625
C626
C674
R614
C620
R611
C611
C623
C606
C615
C605
C609
R605
C617
C612
IC601
CN602
R603
R607
C616
R601
R609
C618
R613
C621
C619
C676
C672
C678
IC603
C670
C630
C628
C627
C607
R606
C666
C664
C663
C679
C654
R635
R634
R632
Q601
C651
C648
C658
C660
R640
C637
C680
C661
IC602
R624
R622
C640
C646
R626
R627
C636
C638
R623
R620
C673
C677
C675
C656
C653
R633
C650
R637
C662
C633
C657
C655
C647
C634
R625
C642
C643
1-647-992-
11
09
1
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6

- **For printed wiring boards.**
- AU-150, MA-170 boards are the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

< DIODE >

D551	8-719-404-46	DIODE	MA110
D552	8-719-404-46	DIODE	MA110

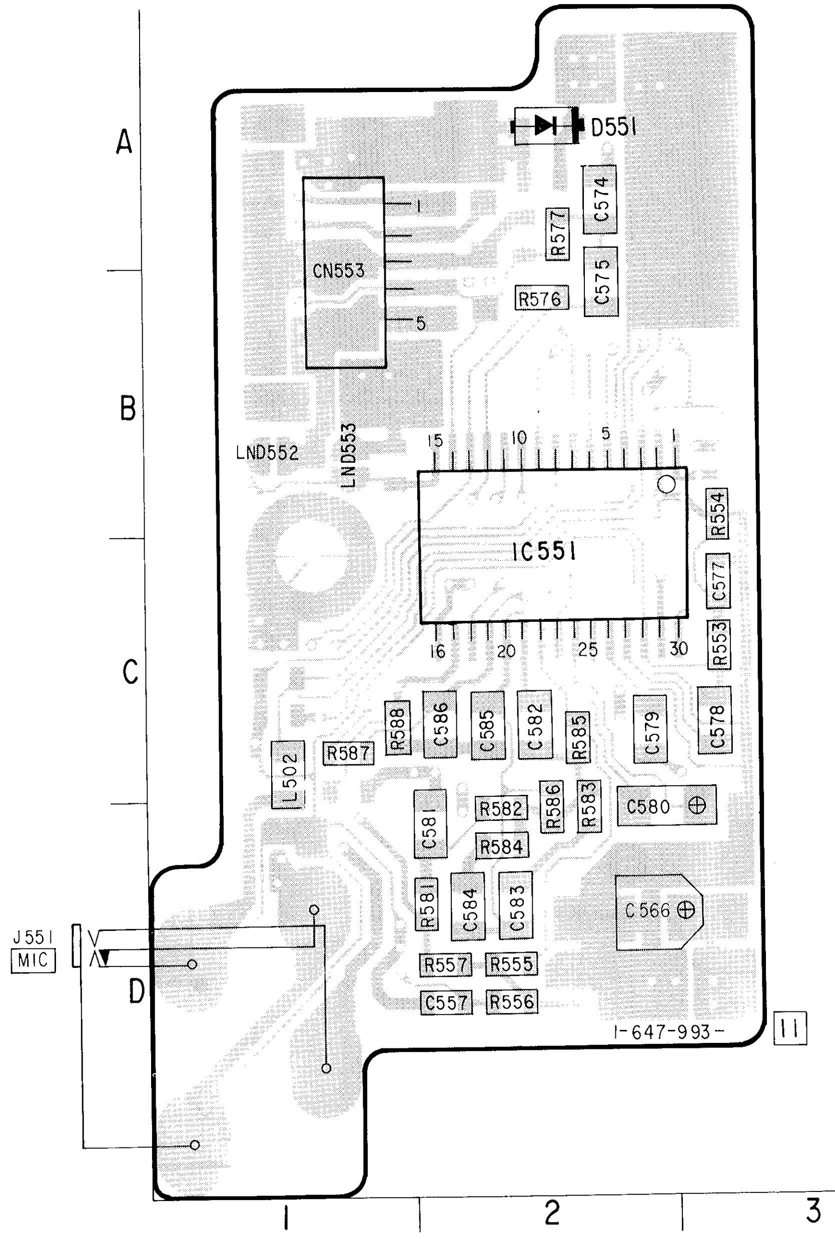
< IC >

IC551	8-759-062-23	IC	CXA1618N-E2
IC553	8-759-998-98	IC	LM358D

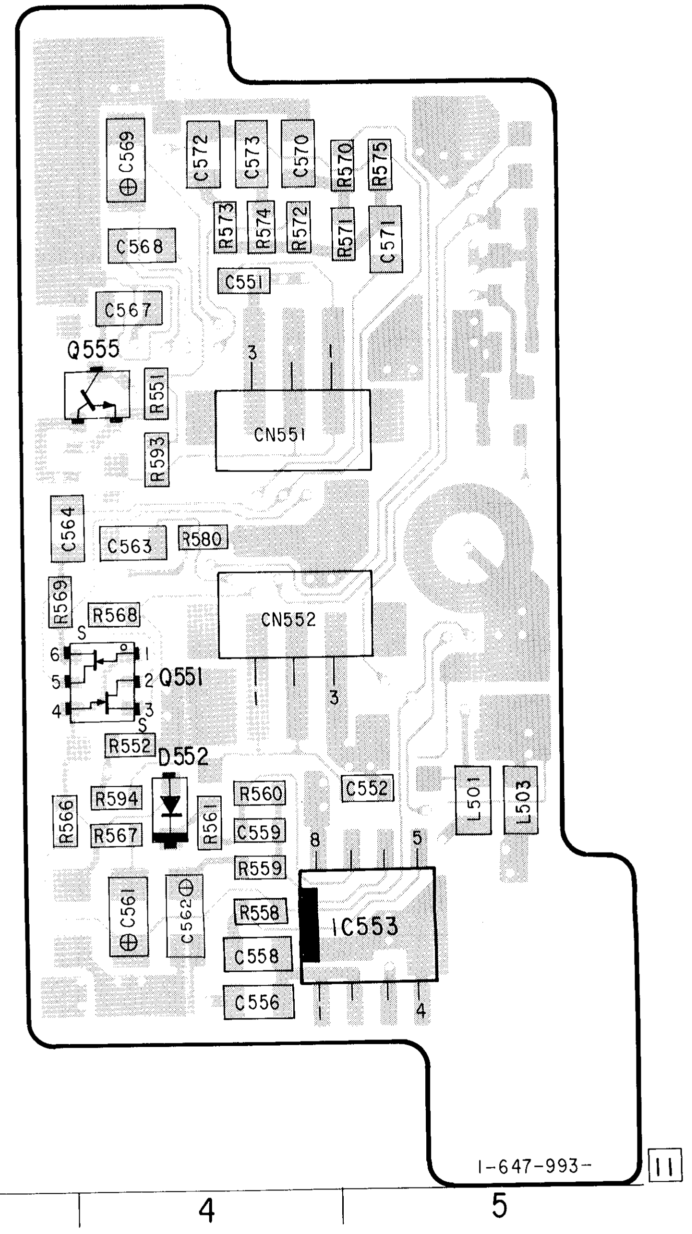
< TRANSISTOR >

Q551	8-729-010-80	TRANSISTOR	FC13
Q555	8-729-822-97	TRANSISTOR	2SC4211-5. 6. 7

MA-170 BOARD (COMPONENT SIDE)


A
B
C
D
D551
CN553
R577
C574
C575
R576
LND552
LND553
IC551
R554
C577
R553
C578
C579
L502
R587
R588
C586
C585
C582
R585
R582
R586
R583
C580
R584
C581
R581
C584
C583
C566
R557
R555
C557
R556
J551
MIC
1-647-993-
11

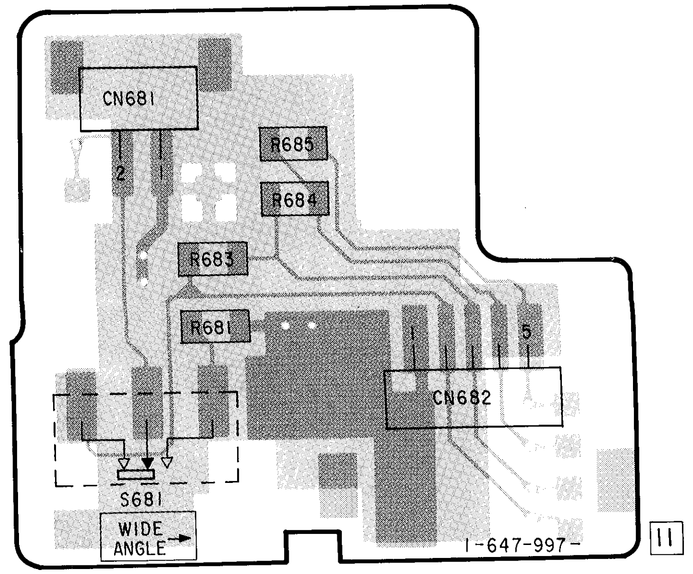
MA-170 BOARD (CONDUCTOR SIDE)


C569
C572
C573
C570
R570
R575
R573
R574
R572
R571
C571
C568
C551
C567
Q555
R551
CN551
R593
C564
C563
R580
R569
R568
CN552
Q551
R552
D552
R566
R594
R567
R561
R560
C559
C552
L501
L503
R559
C561
C562
R558
IC553
C558
C556
1-647-993-
11
1
2
3
4
5

- For printed wiring board of WS-11 board.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.

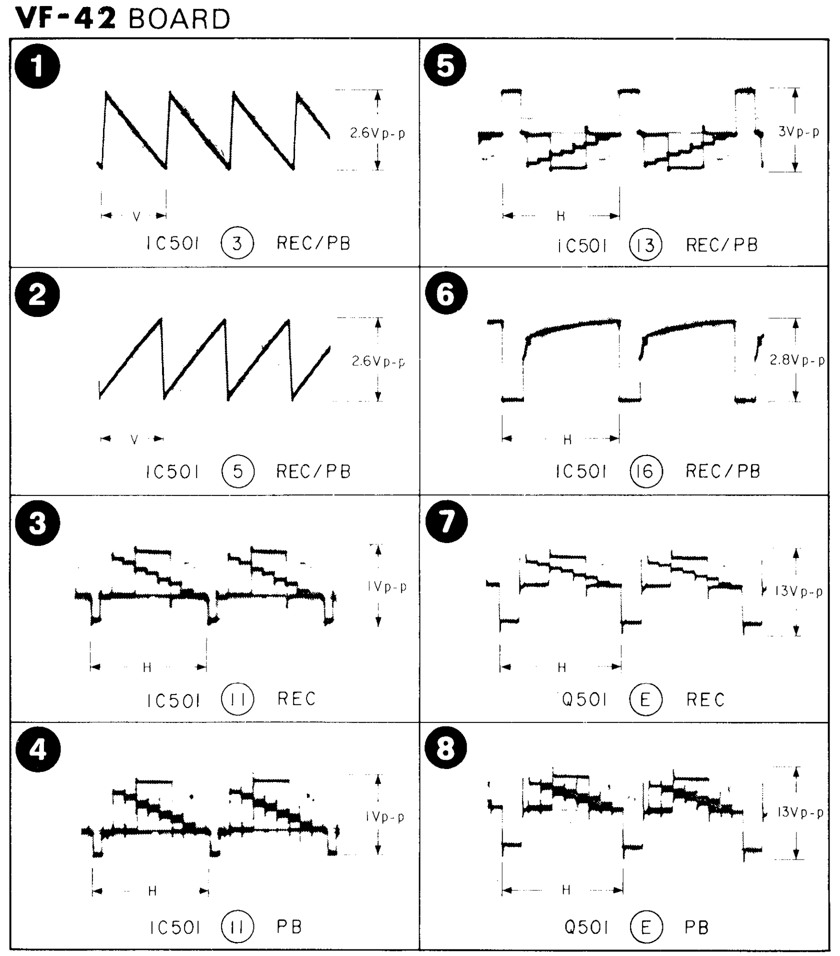
(The other layer's patterns are not indicated.)

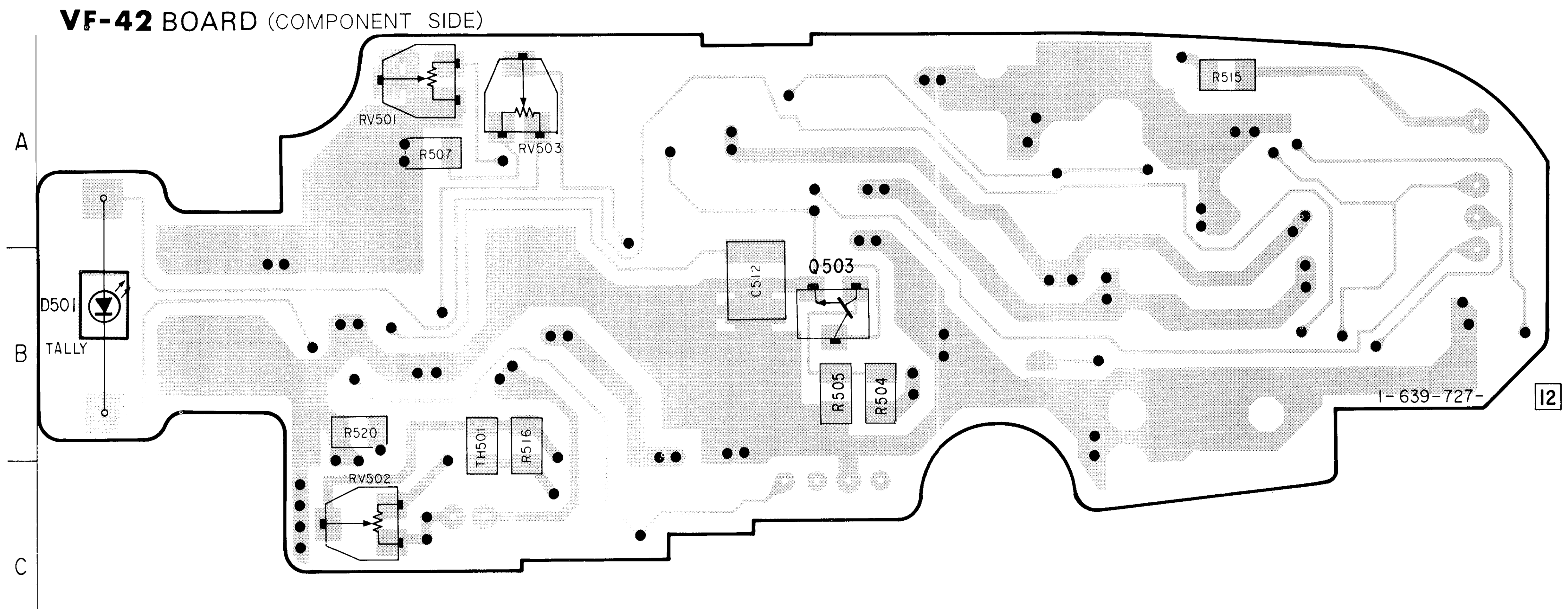
WS-11 BOARD

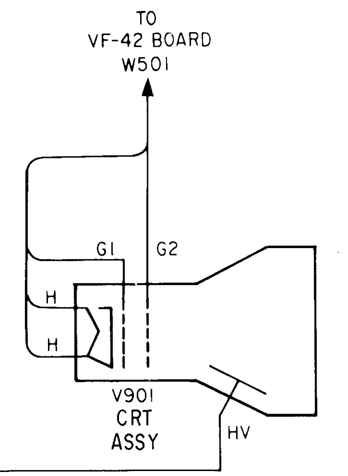

CN681
R685
R684
R683
R681
CN682
S681
WIDE ANGLE
1-647-997-
11

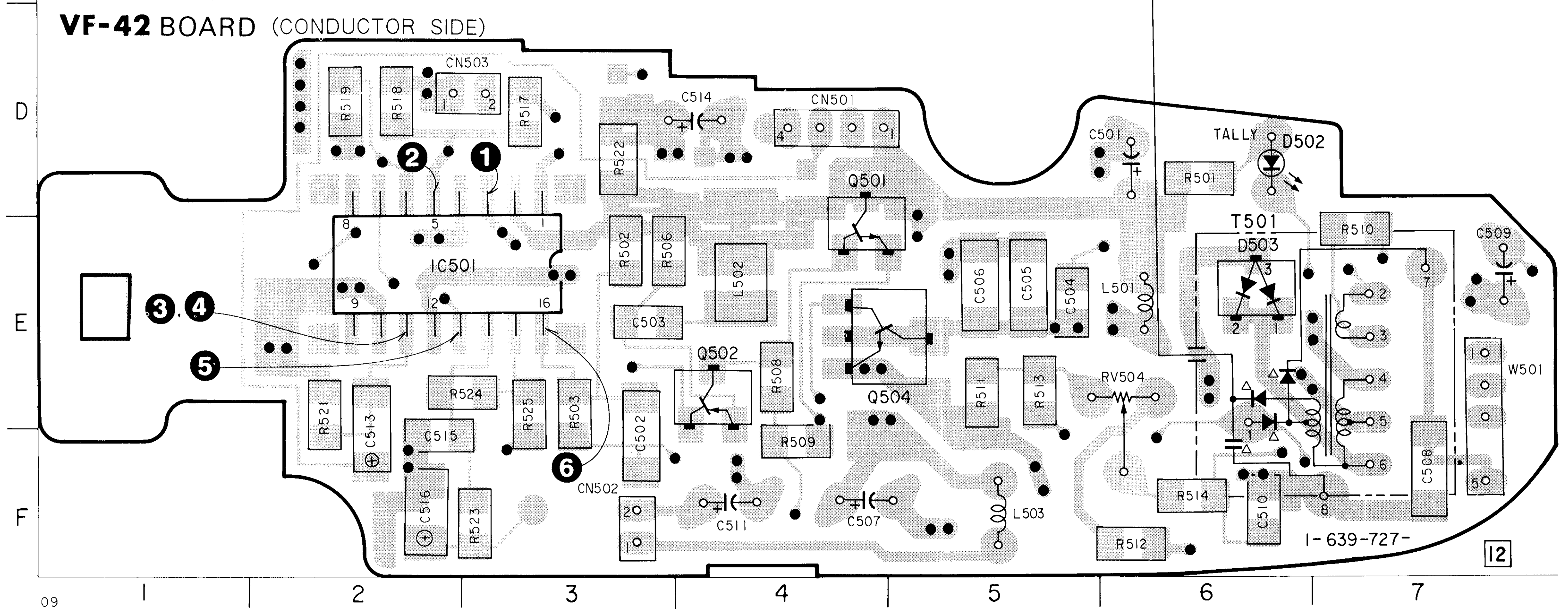
VF-42 (VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-42 BOARD: 1000 series —




VF-42 BOARD (COMPONENT SIDE)
A
B
C
D501
TALLY
RV501
R507
RV503
R515
C512
Q503
R505
R504
R520
RV502
TH501
R516
1-639-727-
12


TO
VF-42 BOARD
W501
G1
G2
H
H
V901
CRT
ASSY
HV


VF-42 BOARD (CONDUCTOR SIDE)
D
E
F
CN503
R519
R518
R517
C514
CN501
R522
❷
❶
IC501
Q501
C501
TALLY
D502
R501
T501
D503
R510
C509
❸,❹
❺
❻
R502
R506
L502
C503
Q502
R508
Q504
C506
C505
C504
L501
RV504
R511
R513
W501
R521
C513
C515
R524
R525
R503
C502
R509
CN502
C516
R523
C511
C507
L503
R514
C510
R512
C508
1-639-727-
12
09
1
2
3
4
5
6
7

< DIODE >

D501	8-719-820-65	LED	TLS221
D502	8-719-984-02	LED	BR4371F
D503	8-719-400-20	DIODE	MA152WA

< IC >

IC501	8-759-420-01	IC	AN2512S

< TRANSISTOR >

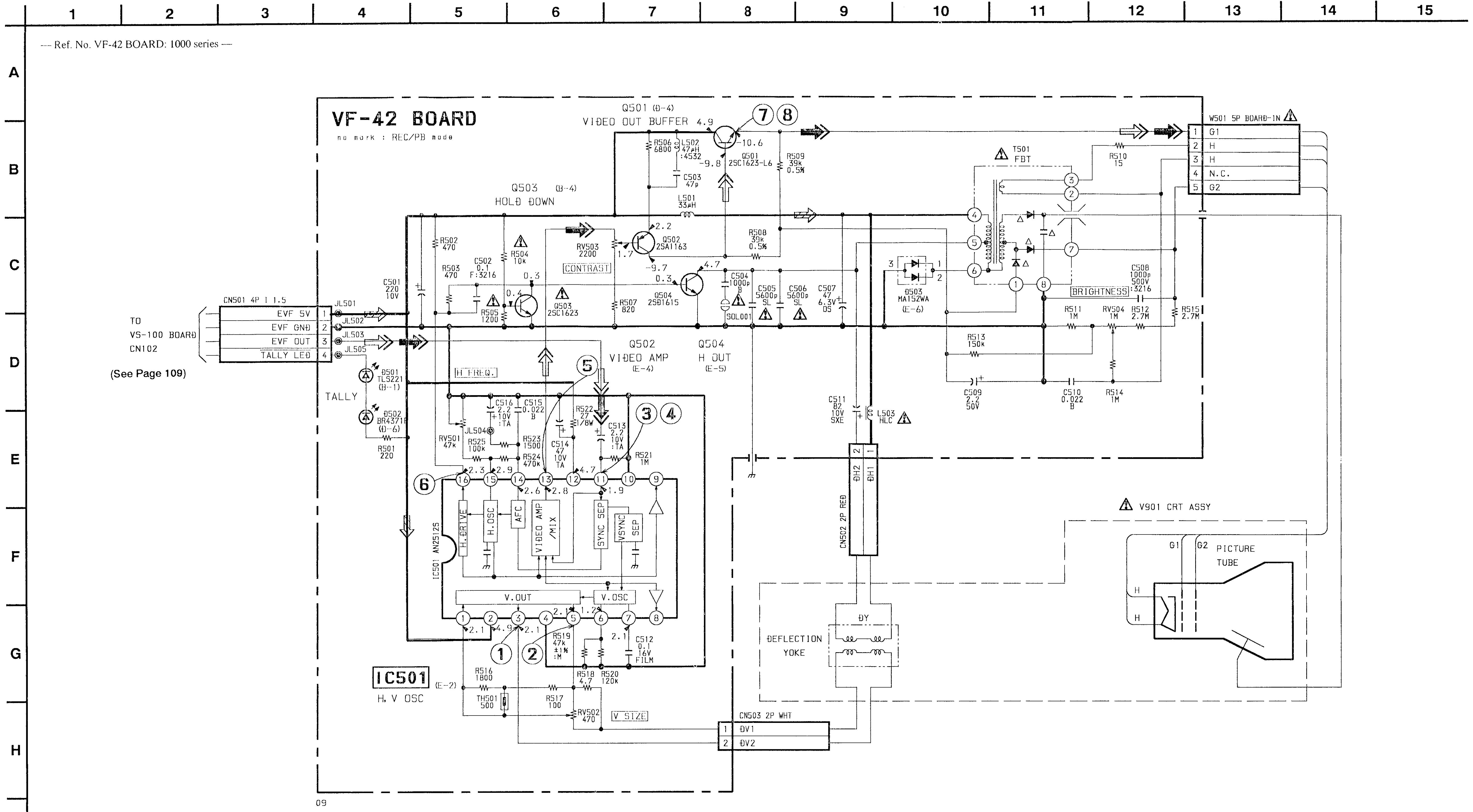
Q501	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q502	8-729-216-31	TRANSISTOR	2SA1163-G
⚠Q503	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q504	8-729-106-68	TRANSISTOR	2SD1615A-GP

- **For printed wiring boards.**
- ● : Through hole.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

VF-42 (VIEW FINDER) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
— Ref. No. VF-42 BOARD: 1000 series —
VF-42 BOARD
no mark : REC/PB mode
Q501 (B-4)
VIDEO OUT BUFFER
Q503 (B-4)
HOLD DOWN
CONTRAST
Q502
VIDEO AMP
(E-4)
Q504
H OUT
(E-5)
T501
FBT
BRIGHTNESS
W501 5P BOARD-IN
G1
H
H
N.C.
G2
CN501 4P I 1.5
EVF 5V
EVF GND
EVF OUT
TALLY LED
TO
VS-100 BOARD
CN102
(See Page 109)
TALLY
D501
TLS221
D502
BR4371E
H FREQ.
IC501 AN2512S
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP.
V.OUT
V.OSC
IC501
(E-2)
H. V OSC
V SIZE
CN502 2P RED
ΦH2
ΦH1
CN503 2P WHT
ΦV1
ΦV2
L503
HLC
D503
MA152WA
(E-6)
V901 CRT ASSY
G1
G2
PICTURE
TUBE
H
H
DY
DEFLECTION
YOKE
Q501 2SC1623-L6
Q502 2SA1163
Q503 2SC1623
Q504 2SD1615
R506 6800
L502 47μH
C503 47p
L501 33μH
R509 39k 0.5W
R508 39k 0.5W
R510 15
R502 470
R503 470
C502 0.1 F:3216
R504 10k
RV503 2200
R505 1200
R507 820
C501 220 10V
C504 1000p B
C505 5600p SL
C506 5600p SL
C507 47 6.3V
SOL001
C508 1000p 500V :3216
R511 1M
RV504 1M
R512 2.7M
R515 2.7M
R513 150k
C509 2.2 50V
C510 0.022 B
R514 1M
C511 82 10V SXE
RV501 47k
R525 100k
C516 2.2 10V TA
C515 0.022 B
R523 1500
R524 470k
C514 47 10V TA
R522 27 1/8W
C513 2.2 10V TA
R521 1M
R501 220
R519 47k
R518 4.7
R520 120k
C512 0.1 16V FILM
R516 1800
TH501 500
R517 100
RV502 470
09

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		➡		
PB		⇨		

DD-56 (POWER), SW-223 (START/STOP SWITCH) PRINTED WIRING BOARDS

— Ref. No. DD-56 BOARD: 1000 series, SW-223 BOARD: 7000 series —

- **For printed wiring boards.**
- DD-56 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- ● : Through hole is omitted.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

< DIODE >

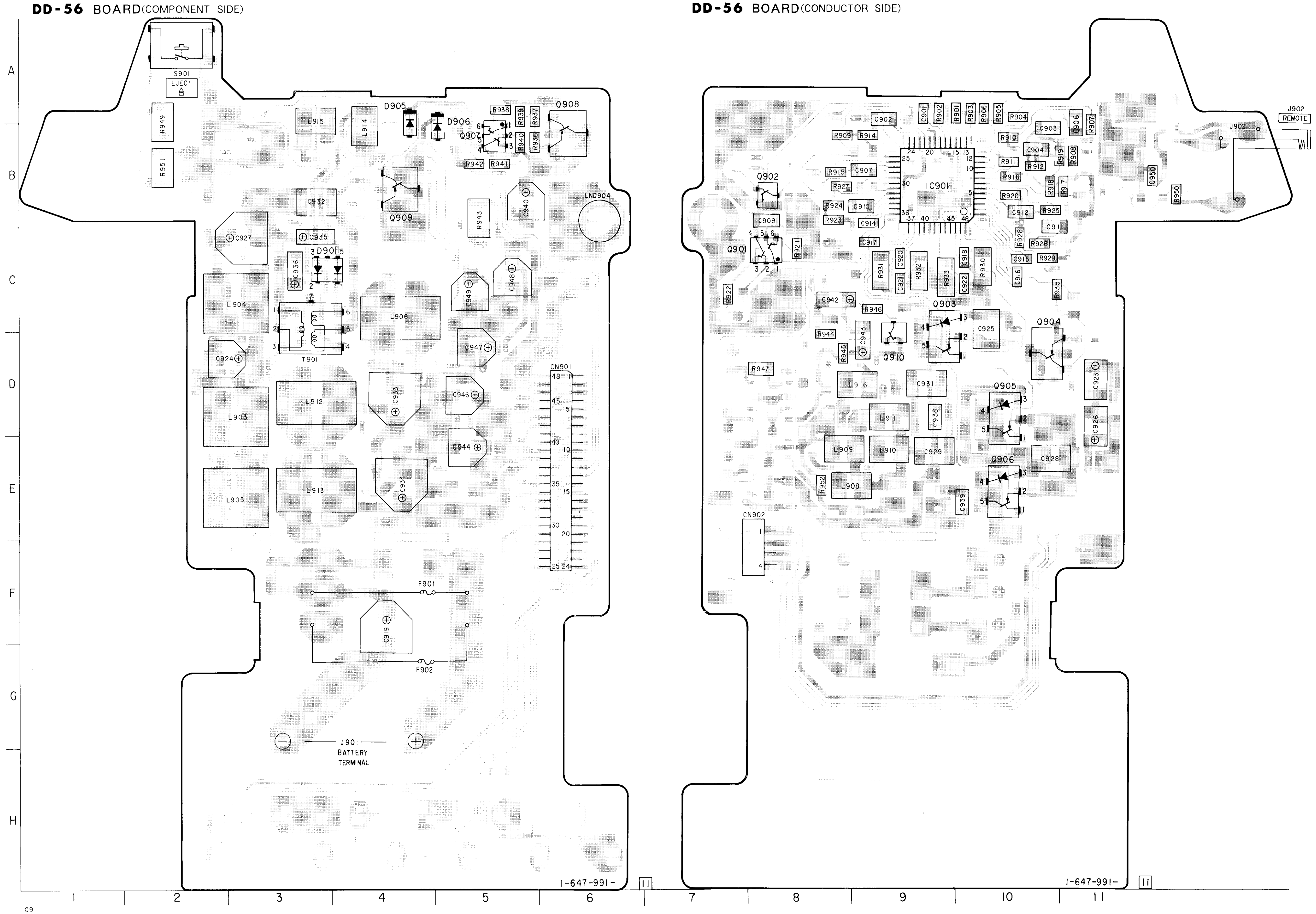
D901	8-719-981-59	DIODE	FC805
D905	8-719-404-46	DIODE	MA110
D906	8-719-404-46	DIODE	MA110

< IC >

IC901	8-759-060-94	IC	MB3785APFV-G-BND-ER

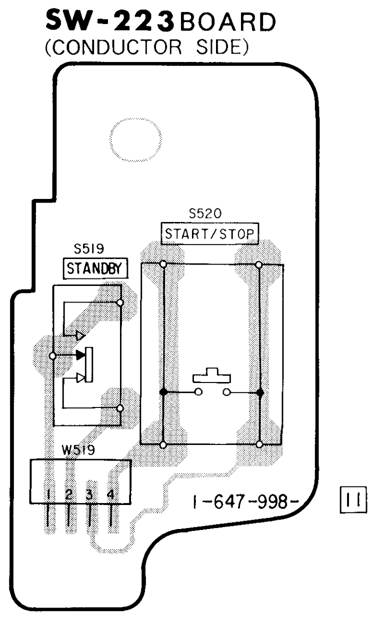
< TRANSISTOR >

Q901	8-729-403-27	TRANSISTOR	XN4401
Q902	8-729-402-42	TRANSISTOR	UN5213
Q903	8-729-823-84	TRANSISTOR	FP102
Q904	8-729-804-41	TRANSISTOR	2SB1122-S
Q905	8-729-823-82	TRANSISTOR	FP101
Q906	8-729-823-82	TRANSISTOR	FP101
Q907	8-729-402-81	TRANSISTOR	XN4501
Q908	8-729-805-25	TRANSISTOR	2SB1121-S
Q909	8-729-805-25	TRANSISTOR	2SB1121-S
Q910	8-729-403-35	TRANSISTOR	UN5113


DD-56 BOARD(COMPONENT SIDE)

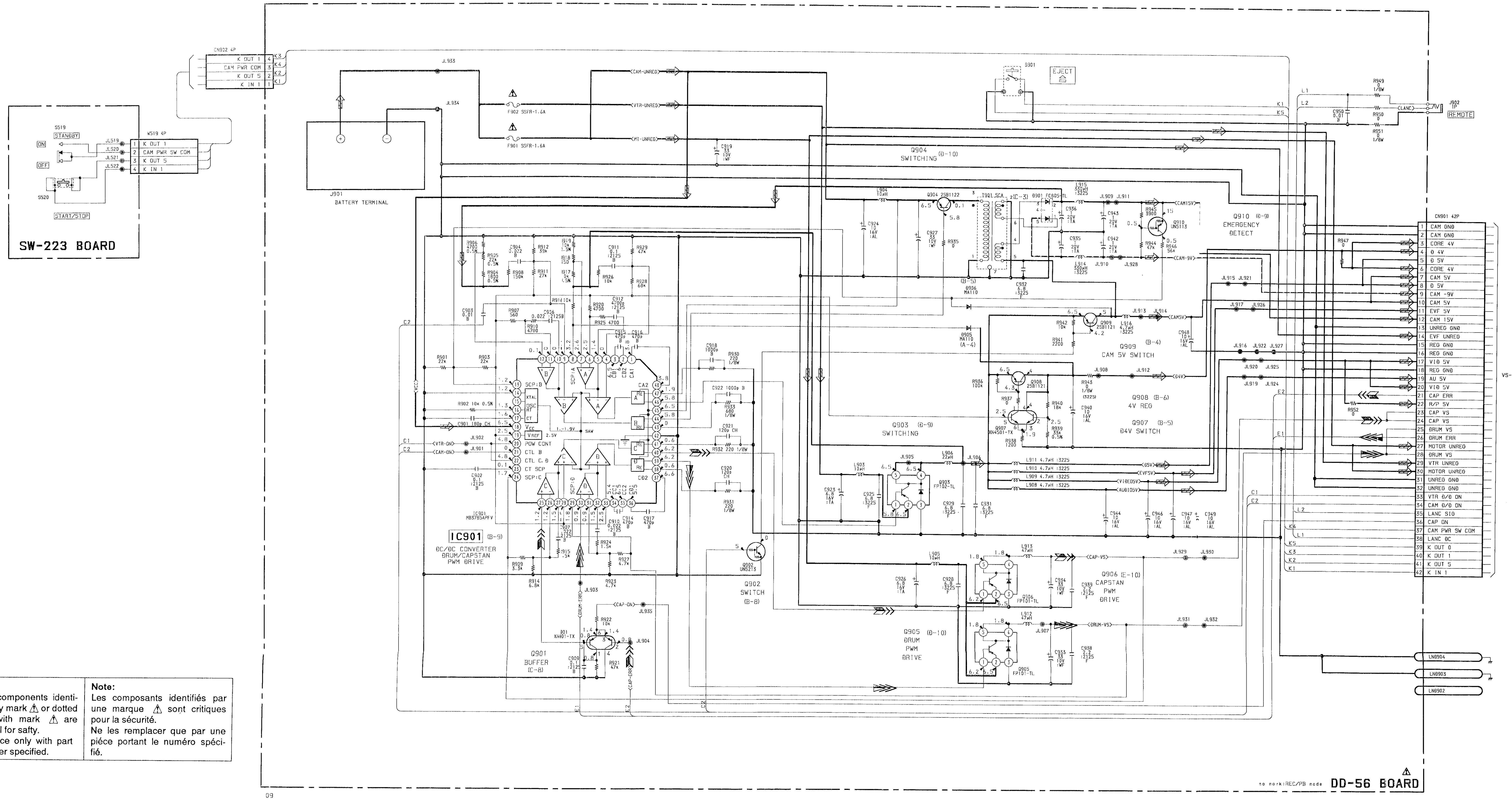
DD-56 BOARD(CONDUCTOR SIDE)

A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
S901
EJECT
R949
R951
L915
L914
D905
D906
Q907
R938
R939
R937
R940
R936
Q908
R942
R941
Q909
C932
R943
C940
LND904
C927
C935
D901
C936
T901
L904
L906
C949
C948
C947
C924
L912
C933
C946
CN901
L903
C944
L905
L913
C934
F901
C919
F902
J901
BATTERY
TERMINAL
1-647-991-
11
C902
R909
R914
C901
R902
R901
R903
R906
R905
R904
C903
C906
R907
R910
C904
R919
R938
J902
REMOTE
IC901
Q902
R915
C907
R911
R912
R916
R918
R917
C950
R950
R927
R920
R924
C910
C912
R925
C909
R923
C914
R928
C911
Q901
R921
C917
R926
R931
C920
R932
R933
C918
R930
C915
R929
R922
C921
C922
C916
R935
C942
R946
Q903
Q904
R944
C943
C925
R945
Q910
R947
L916
C931
Q905
C923
L911
C938
C926
L909
L910
C929
Q906
C928
R952
L908
C939
CN902
1-647-991-
11


SW-223BOARD
(CONDUCTOR SIDE)

S520
START/STOP
S519
STANDBY
W519
1-647-998-
11

— Ref. No. DD-56 BOARD: 1000 series, SW-223 BOARD: 7000 series —


SW-223 BOARD
START/STOP
STANDBY
J901
BATTERY TERMINAL
IC901
DC/DC CONVERTER
DRUM/CAPSTAN
PWM DRIVE
Q901
BUFFER
Q902
SWITCH
Q903
SWITCHING
Q904
SWITCHING
Q905
DRUM
PWM
DRIVE
Q906
CAPSTAN
PWM
DRIVE
Q907
D4V SWITCH
Q908
4V REG
Q909
CAM 5V SWITCH
Q910
EMERGENCY
DETECT
EJECT
REMOTE
CN901 42P
TO
VS-100 BOARD
CN404
(See Page 113)
DD-56 BOARD

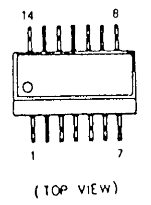
Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- **SIGNAL PATH**

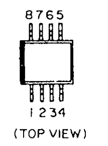
	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)		⋙	
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)		⋙	
Ref. signal			

4-3. SEMICONDUCTORS

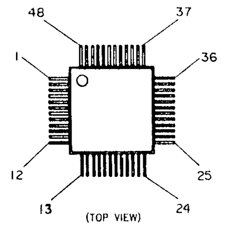
AN2512S


14
8
1
7
(TOP VIEW)

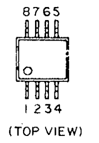
BR9021AF
LM358DR


8765
1234
(TOP VIEW)

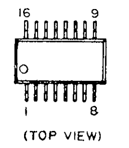
CXA1202R
CXA1208R
CXA1481AR
CXA1488R


48
37
1
36
12
25
13
24
(TOP VIEW)

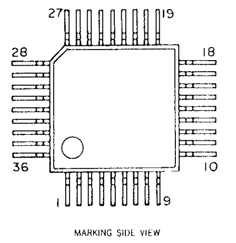
CXA1211M
NJM2234M
NJM3414M
S-8420AF


8765
1234
(TOP VIEW)

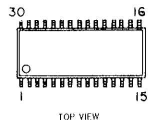
CXA1452
µPD6456GS-620


16
9
1
8
(TOP VIEW)

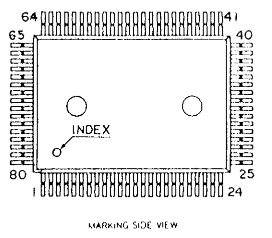
CXA1536Q


27
19
28
18
36
10
1
9
MARKING SIDE VIEW

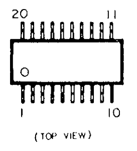
CXA1618N
MCD004BM


30
16
1
15
TOP VIEW

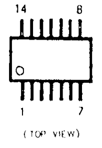
CXD2100Q
µPD75316GF


64
41
65
40
INDEX
80
25
1
24
MARKING SIDE VIEW

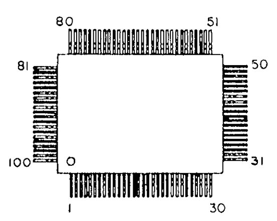
CXD1250AN
CXD2104BN
MB88346BPFV
MB88347BPFV
MPC1720VM
MPC1724VM
µPD7564G-540


20
11
1
10
(TOP VIEW)

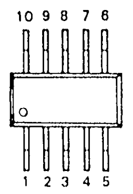
CXL5502M
TL1596CDB


14
8
1
7
(TOP VIEW)

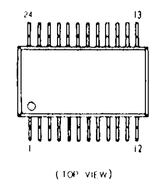
CXP80624


80
51
81
50
100
31
1
30

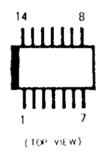
LB1830M


10 9 8 7 6
1 2 3 4 5

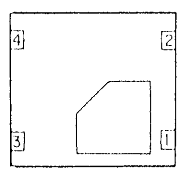
LB8111V


24
13
1
12
(TOP VIEW)

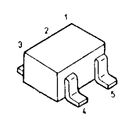
LM324D


14
8
1
7
(TOP VIEW)

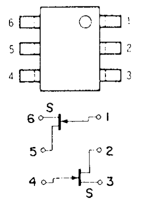
RS-20E-T



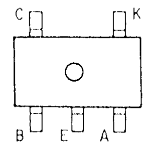
TC7S66F



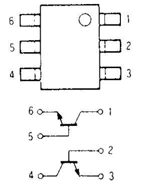
FC13



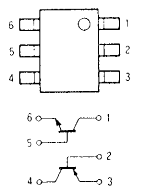
FP101
FP102



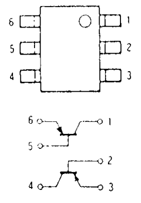
XN4213
XN4215
XN4501



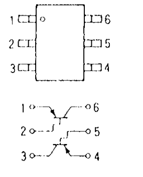
XN4312



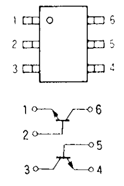
XN4401



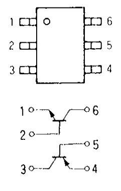
XP4401



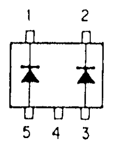
XP4501



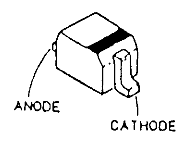
XP4601



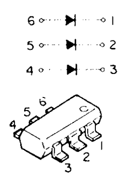
FC805



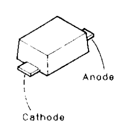
MA110


ANODE
CATHODE

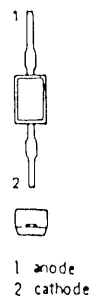
MA121



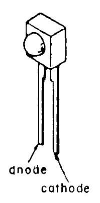
MA728
MA8082-M


Anode
Cathode

TLS221


1
2
1 anode
2 cathode

BR4371F

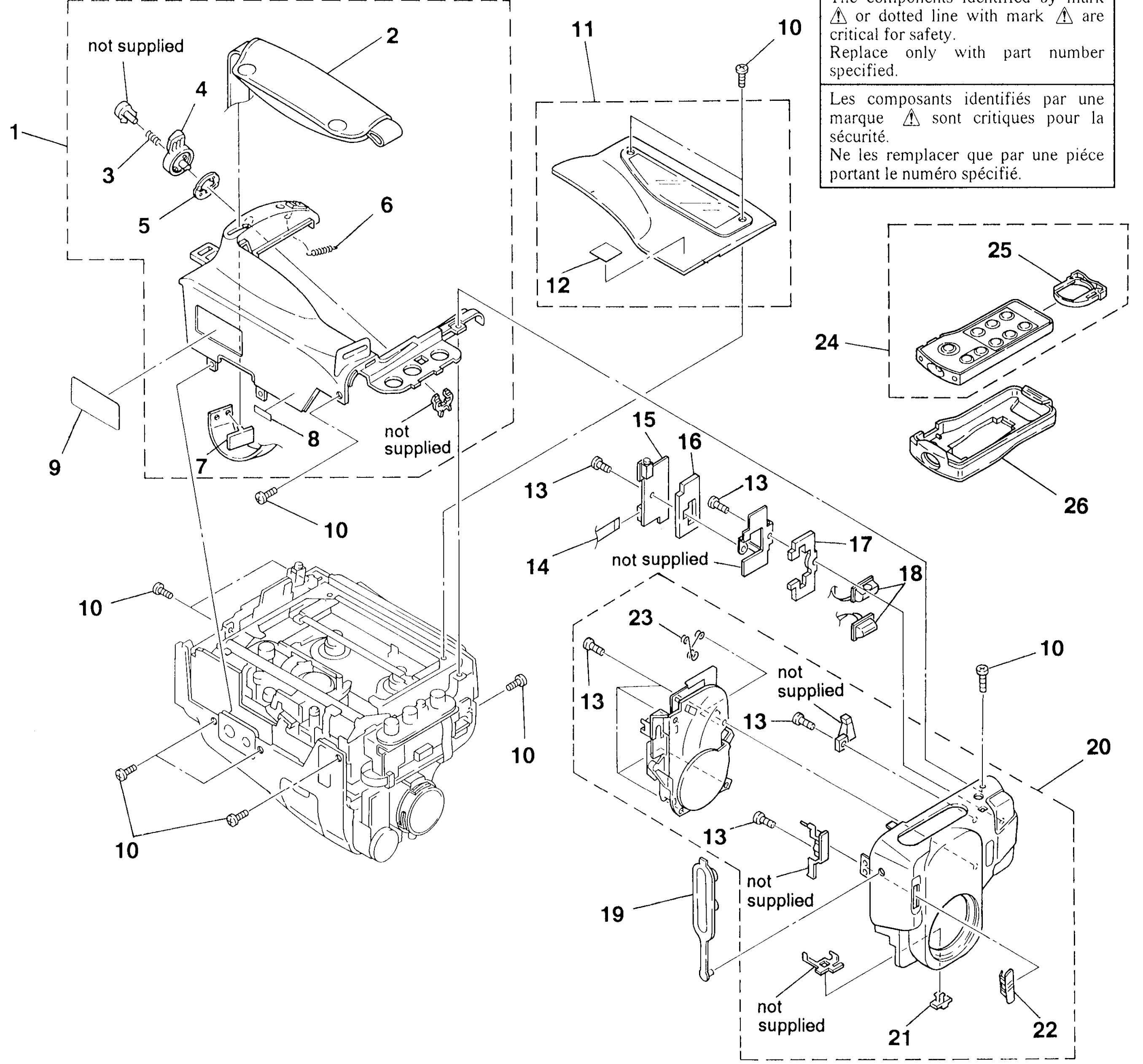

anode
cathode

SECTION 5
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked “ * ” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

5-1. CABINET (L) AND F PANEL ASSEMBLIES


not supplied
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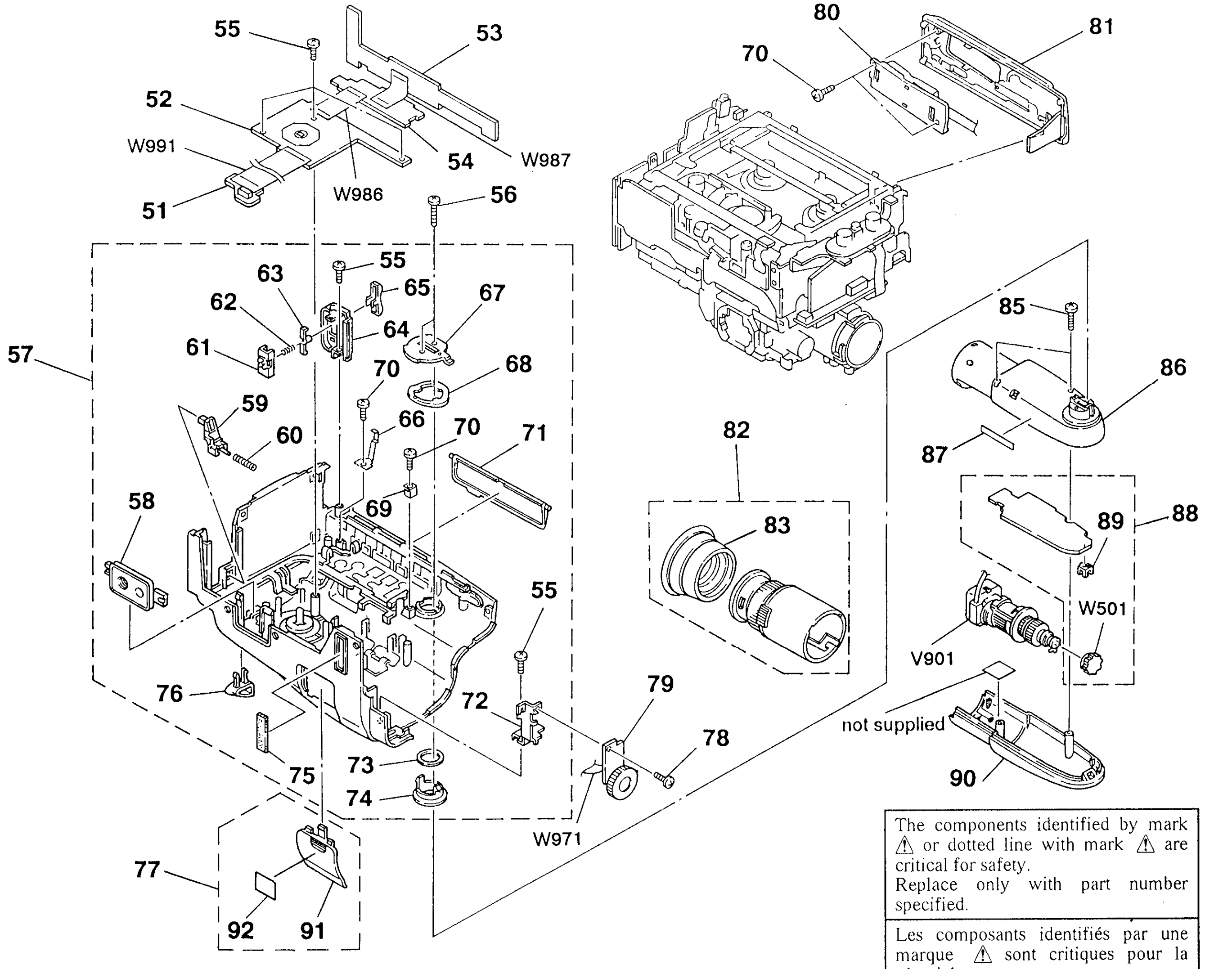
25
26
not supplied
not supplied
not supplied
not supplied
not supplied

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
1	X-3942-859-1	CABINET (L) ASSY (TR61:US)	
1	X-3942-969-1	CABINET (L) ASSY (TR61:CND/TR323)	
2	3-736-807-01	BELT, GRIP	
3	3-578-221-00	SPRING, COMPRESSION	
4	3-942-985-01	KNOB, STAND-BY	
5	3-736-364-01	SPRING	
6	4-602-490-00	SPRING, TENSION	
7	3-942-895-01	STOPPER, BELT	
* 8	3-704-367-01	LABEL (TR61:US)	
* 9	3-953-488-01	LABEL, MODEL NUMBER (U/C)(TR61)	
* 9	3-953-965-01	LABEL, MODEL NUMBER (E)(TR323)	
10	3-719-381-01	SCREW (M2X4)	
11	X-3942-856-1	LID ASSY, CASSETTE (TR61)	
11	X-3942-970-1	LID ASSY, CASSETTE (TR323)	
* 12	3-703-713-41	STICKER, SONY SYMBOL (10)	
13	3-719-601-01	SCREW (B2X5), TAPPING	
14	1-696-487-11	CABLE, FLAT (FFC-90)	
15	A-7063-582-A	MA-170 BOARD, COMPLETE	
* 16	3-953-646-01	URETHANE (MIC)	
* 17	3-953-645-01	CUSHION (MIC)	
18	A-7091-800-A	MICROPHONE UNIT	
19	3-953-652-01	COVER, JACK	
20	X-3942-857-1	PANEL ASSY, FRONT	
21	3-945-269-01	KNOB, S	
22	3-953-655-01	KNOB (LENS)	
23	3-947-357-01	SPRING, TORSION	
24	1-465-927-71	REMOTE COMMANDER (CAM CORDER) (RMT-507)	
25	3-708-412-01	LID, REMOTE COMMANDER	
26	3-943-154-11	HOLDER (B), REMOTE CONTROL	

5-2. CABINET (R) AND EVF ASSEMBLIES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W991
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W987
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W986
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W971
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83
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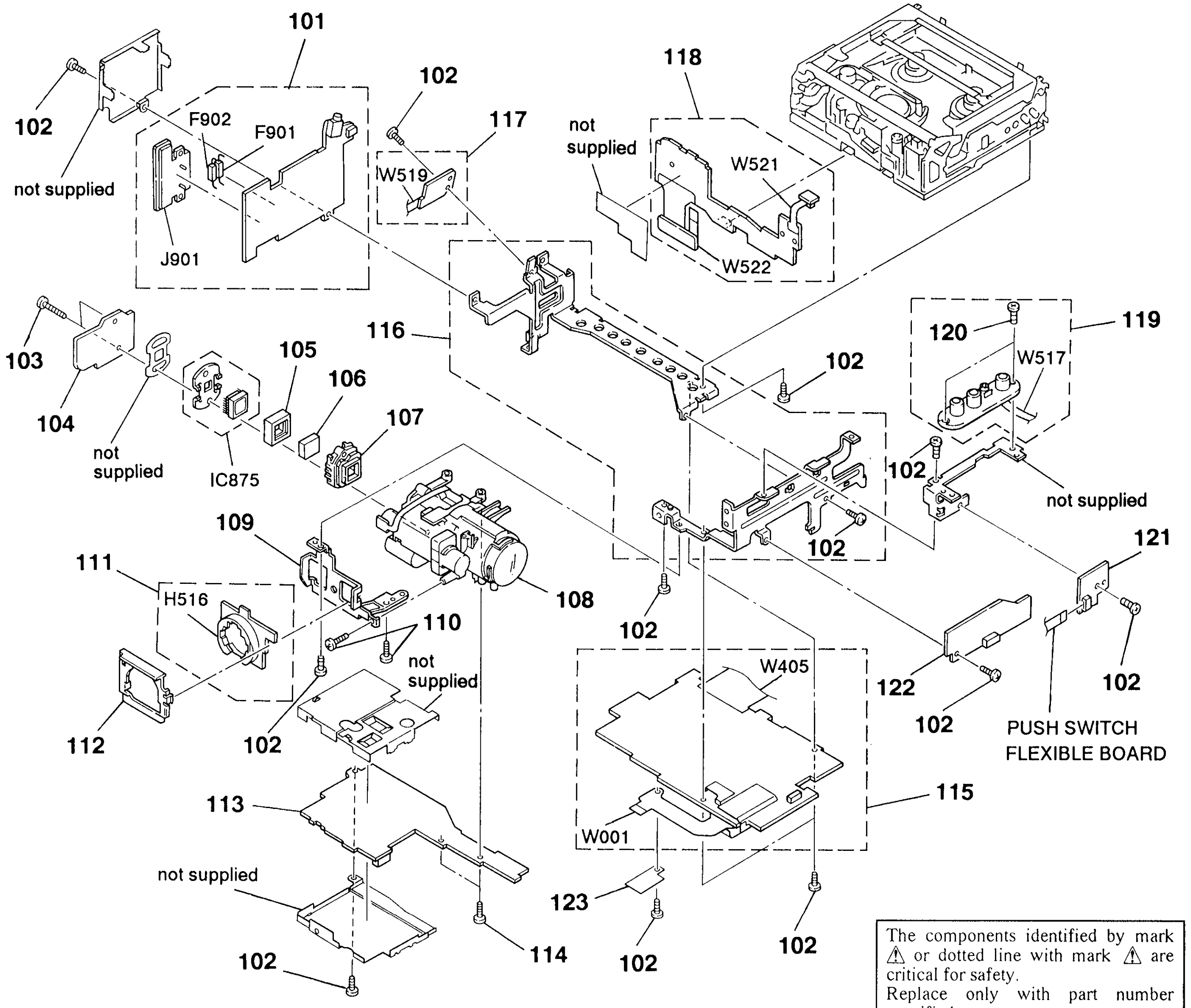
88
W501
V901
not supplied
90

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
51	A-7071-835-A	CN-73 BOARD, COMPLETE	
52	A-7071-831-A	CF-34 BOARD, COMPLETE	
53	A-7071-833-A	VK-32 BOARD, COMPLETE	
54	A-7071-832-A	ED-37 BOARD, COMPLETE	
55	3-713-790-21	SCREW (M2X6), TAPPING, P3	
56	3-740-546-41	SCREW (M2X10)	
57	X-3942-858-1	CABINET (R) ASSY	
58	3-942-911-01	SCREW, TRIPOD	
59	3-948-990-01	LOCK, BATTERY	
60	3-426-508-00	SPRING, COMPRESSION	
61	3-948-839-01	BLIND, POWER	
62	3-303-973-00	SPRING, COMPRESSION	
63	3-946-186-01	PUSH BUTTON, POWER	
64	3-948-975-01	POWER (BASE)	
65	3-946-248-01	BUTTON, POWER	
66	3-948-988-01	SPRING, LEAF, VK	
67	3-747-111-01	PLATE, LOCK, TILT	
68	3-747-110-01	SPRING, LEAF, TILT	
69	3-747-178-01	REINFORCEMENT, TILT LOCK	
70	3-719-601-01	SCREW (B2X5), TAPPING	
71	3-948-976-01	DOOR, CONTROL	
* 72	3-948-987-01	FRAME, MF	
73	3-747-112-01	RING, TILT	
74	3-747-109-01	SLEEVE, EVF	
75	3-949-008-01	SHEET, FOOT	
76	3-948-989-01	KNOB, BATTERY	
77	X-3942-113-1	LID ASSY, BATTERY, LITHIUM	
78	3-713-786-51	SCREW (M2X3)	
79	A-7071-834-A	MF-214 BOARD, COMPLETE	
80	1-692-257-31	SWITCH, PUSH (ZOOM)	
81	X-3941-894-1	LID ASSY, LS	
82	X-3941-603-1	HOLDER ASSY, FINDER	
83	3-946-426-01	EYE CUP	
85	3-713-790-31	SCREW (M2X8), TAPPING, P3	
86	X-3940-706-1	CABINET (L) ASSY, EVF	
* 87	3-744-894-11	LABEL, EVF	
88	A-7063-183-A	VF-42 BOARD, COMPLETE (3120)	
89	3-942-888-01	HOLDER, LED (TR323)	
90	3-943-077-01	CABINET (R), EVF	
91	3-948-843-01	LID, BATTERY CASE, LITHIUM	
92	3-704-256-01	LABEL, CAUTION	
⚠V901	1-452-565-11	CRT ASSY (M01KKD70WB)	
⚠W501	1-540-019-21	SOCKET ASSY, CRT	
W971	1-696-484-11	CABLE, FLAT (FFC-87)	
W986	1-696-621-11	FP-590 FLEXIBLE BOARD	
W987	1-696-622-11	FP-591 FLEXIBLE BOARD	
W991	1-696-483-11	CABLE, FLAT (FFC-86)	

5-3. MAIN BOARDS ASSEMBLY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102
not supplied
F902
F901
J901
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117
W519
118
not supplied
W521
W522
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104
not supplied
IC875
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W517
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not supplied
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H516
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not supplied
108
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102
121
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102
PUSH SWITCH FLEXIBLE BOARD
W405
115
W001
113
not supplied
114
123
102
102
102

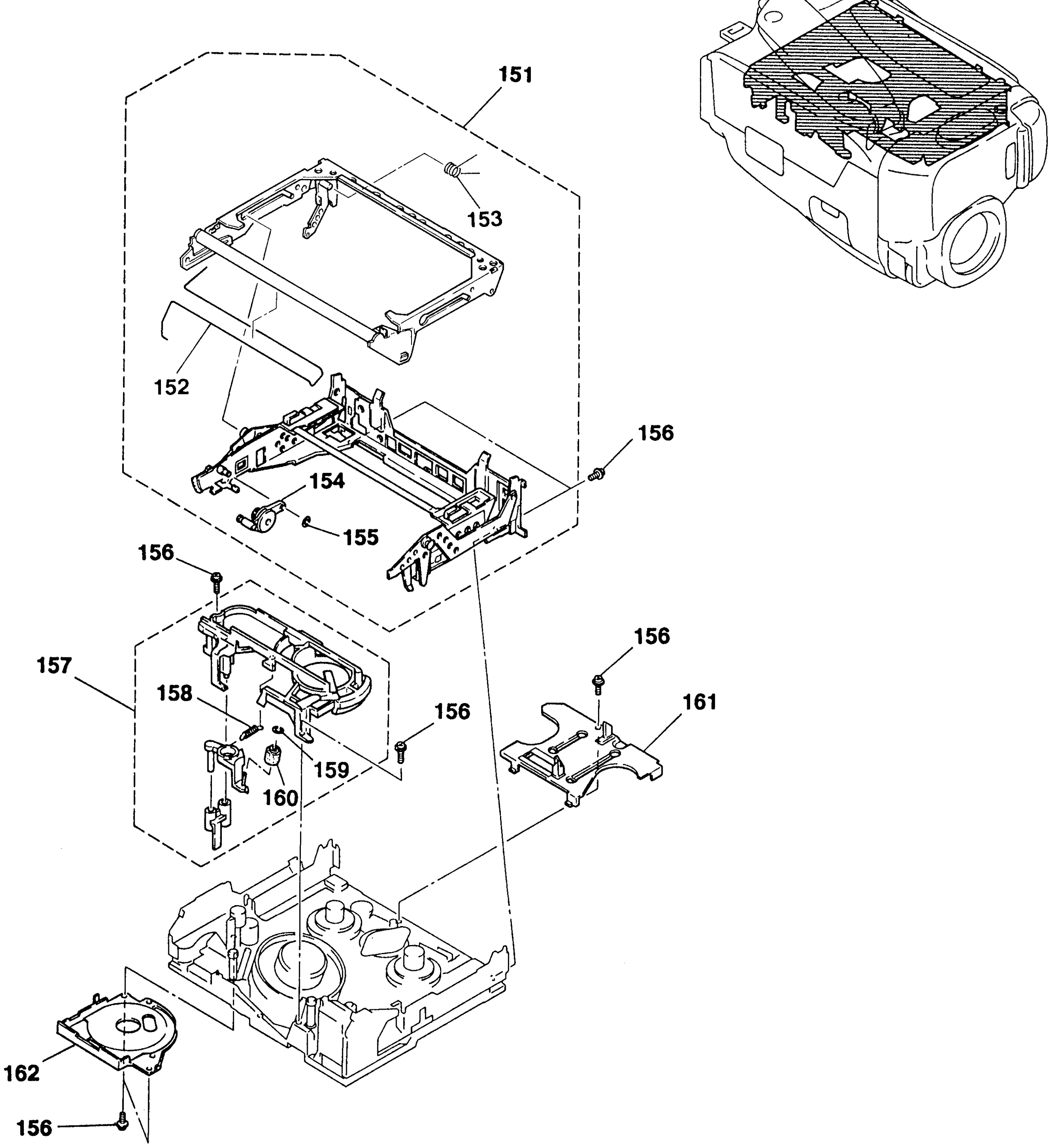
Be sure to read "Precautions for Replacement of CCD Imager" on page 87 when changing the CCD imager.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
101	A-7063-580-A	DD-56 BOARD, COMPLETE	
102	3-713-786-51	SCREW (M2X3)	
103	3-947-268-01	SCREW (B TIGHT) (2), TAPPING	
104	A-7063-575-A	CD-106 BOARD, COMPLETE	
105	3-946-857-01	RUBBER (S), SEAL	
106	1-547-558-21	FILTER BLOCK, OPTICAL	
107	3-946-856-01	ADAPTOR (H), CCD FITTING	
108	1-547-548-11	LENS, ZOOM (VCL-6210WC)	
* 109	3-949-001-01	FRAME, LENS	
110	3-713-790-21	SCREW (M2X6), TAPPING, P3	
111	A-7071-829-A	LI-46 BOARD, COMPLETE	
112	3-948-842-01	HOLDER, LI	
113	A-7063-577-A	VC-133 BOARD, COMPLETE	
114	3-719-601-01	SCREW (B2X5), TAPPING	
115	A-7063-576-A	VS-100 BOARD, COMPLETE	
* 116	X-3942-209-1	FRAME (UPPER LOWER) ASSY	
117	A-7071-828-A	SW-223 BOARD, COMPLETE	
118	A-7063-578-A	SL-33 BOARD, COMPLETE	
119	A-7063-581-A	JK-99 BOARD, COMPLETE	
120	3-719-381-01	SCREW (M2X4)	
121	A-7071-830-A	WS-11 BOARD, COMPLETE	
122	A-7063-579-A	AU-150 BOARD, COMPLETE	
123	3-951-136-02	SHIELD, DRUM	
⚠F901	1-532-778-21	FUSE, MICRO (SECONDARY)	
⚠F902	1-532-778-21	FUSE, MICRO (SECONDARY)	
H516	1-550-104-32	HOLDER, BATTERY	
IC875	A-7030-368-A	CCD BLOCK ASSY (AUTO) (CCD IMAGER)	
J901	1-537-281-41	TERMINAL BOARD	
W001	1-696-489-11	FP-588 FLEXIBLE BOARD	
W405	1-644-285-11	FP-572 FLEXIBLE BOARD	
W517	1-751-165-11	CABLE, FLAT (FFC-100)	
W519	1-696-488-11	CABLE, FLAT (FFC-92)	
W521	1-642-186-11	FP-437 FLEXIBLE BOARD	
W522	1-696-490-11	FP-589 FLEXIBLE BOARD	

5-4. CASSETTE COMPARTMENT HOLDER ASSEMBLY


151
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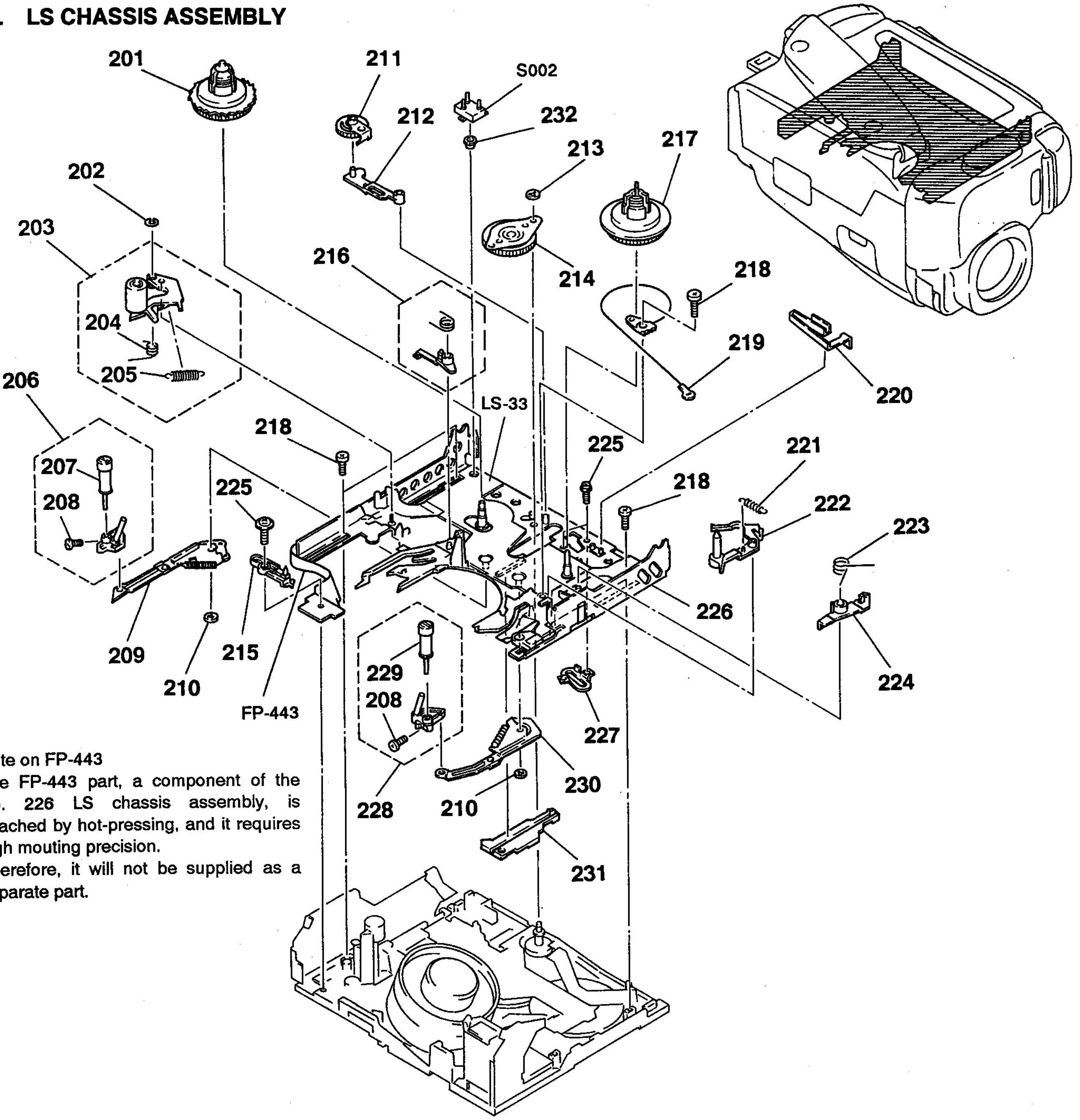
156

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	A-7040-312-K	CASSETTE COMPARTMENT BLOCKASSY		157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
152	3-945-773-01	BAR, TORSION		158	3-945-760-01	SPRING, TENSION	
153	3-945-771-01	SPRING, TORSION		159	3-321-393-01	WASHER, STOPPER	
154	X-3941-287-2	DAMPER ASSY		160	X-3166-813-1	ROLLER ASSY, HC	
155	3-315-384-31	WASHER, STOPPER		161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
156	3-947-503-01	SCREW (M1.4X2.5)		162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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S002
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LS-33
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FP-443
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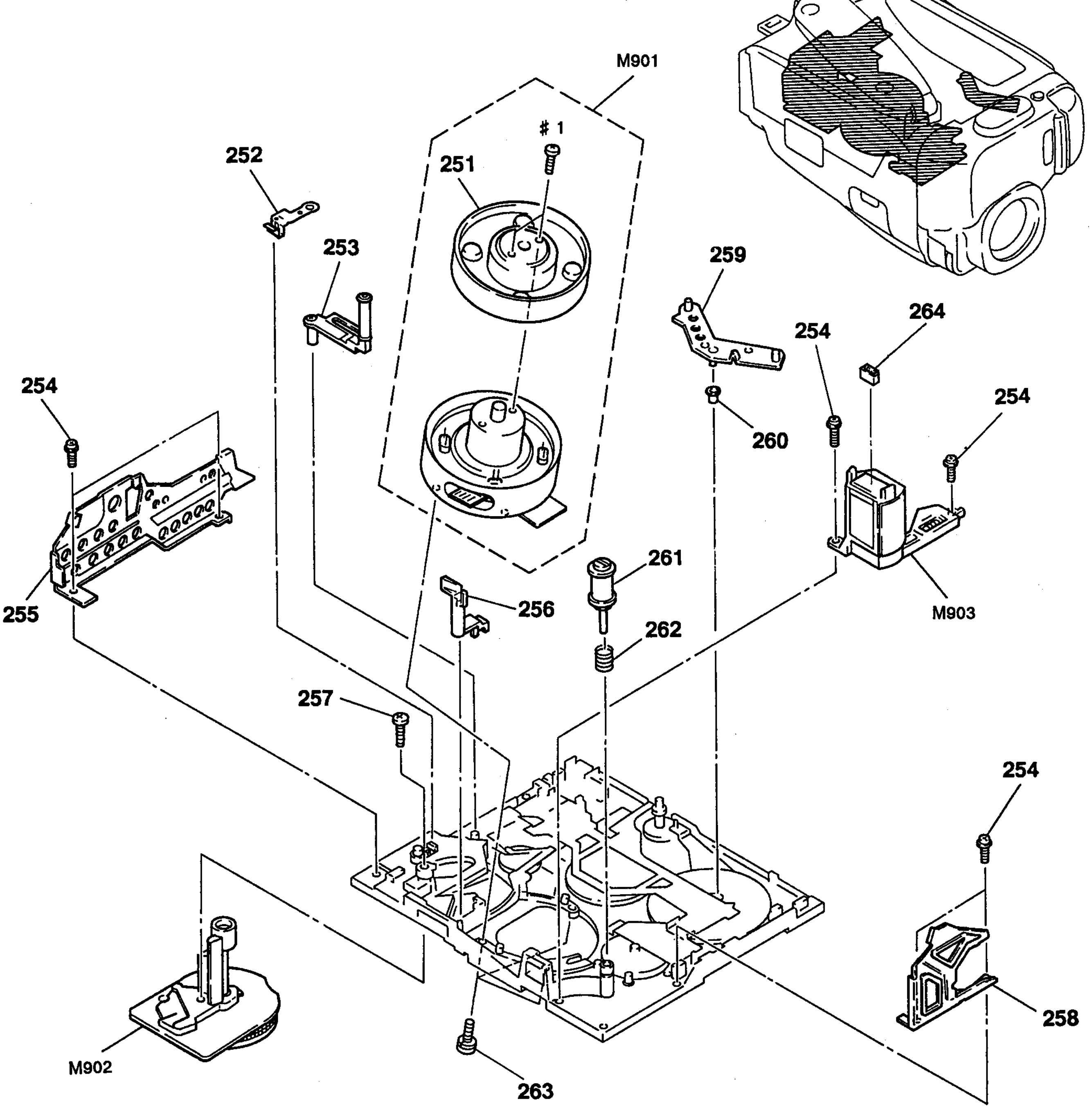
Note on FP-443
The FP-443 part, a component of the No. 226 LS chassis assembly, is attached by hot-pressing, and it requires high mouting precision.
Therefore, it will not be supplied as a separate part.

Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-5	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	3-945-783-01	SPRING, TENSION	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-669-465-00	WASHER (1.5), STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-5	GEAR ASSY, GOOSENECK	
215	3-947-644-01	RETAINER, TG5 (BASE)	
216	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
217	X-3941-275-6	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-948-810-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3941-269-1	ROLLER ASSY, TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
232	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

5-6. MECHANISM CHASSIS ASSEMBLY (1)


M901
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M903
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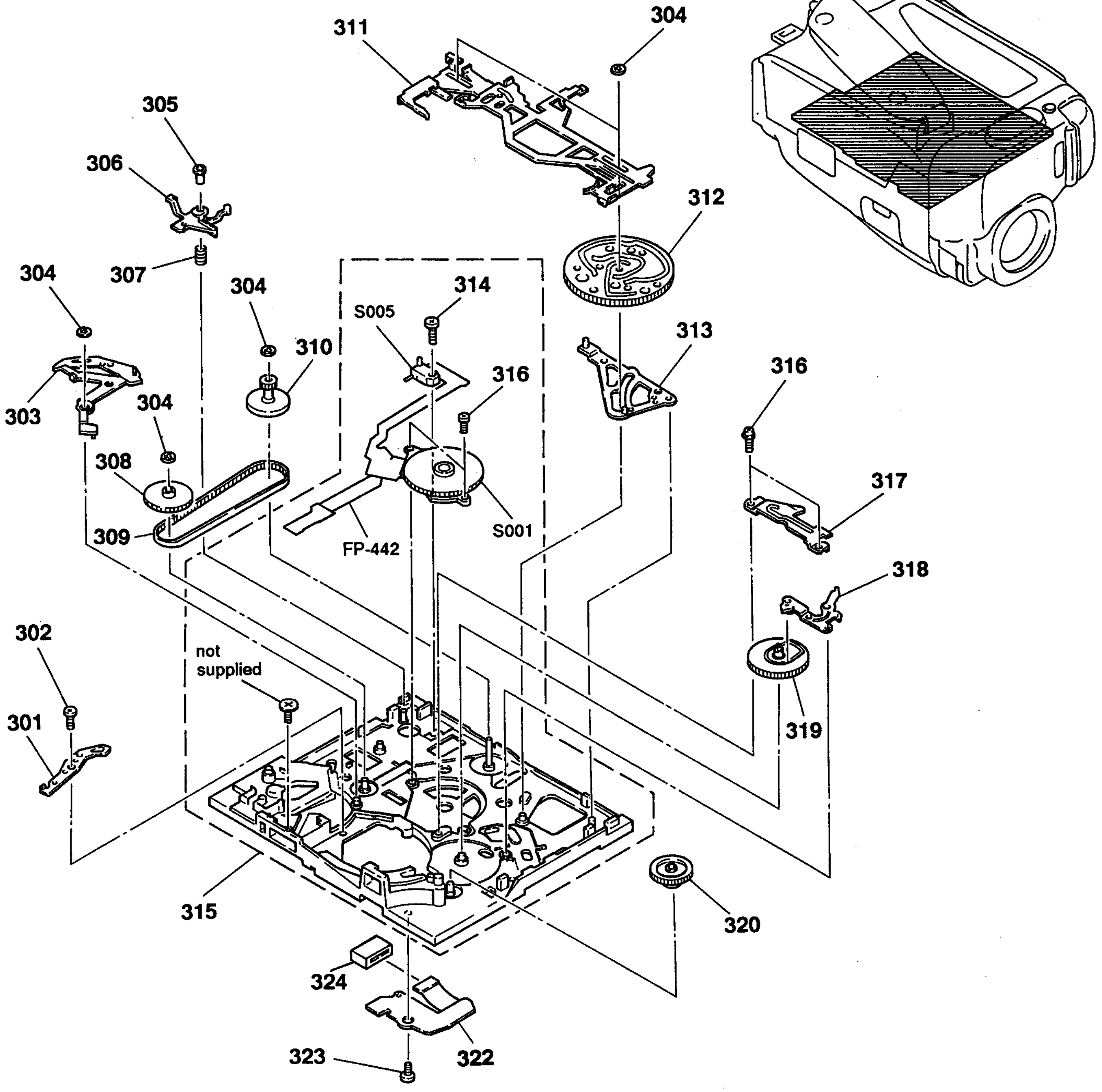
M902
263

Ref. No.	Part No.	Description	Remark
251	A-7049-501-A	DRUM ASSY, UPPER (DGR-78-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1.4X2.5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	3-945-691-01	PLATE (S), SIDE	
259	3-945-701-01	ARM, LS	
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-686-493-01	SCREW (M2X5), P1	
264	1-568-323-11	CONNECTOR (4P)	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)


311
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S005
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FP-442
S001
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not supplied
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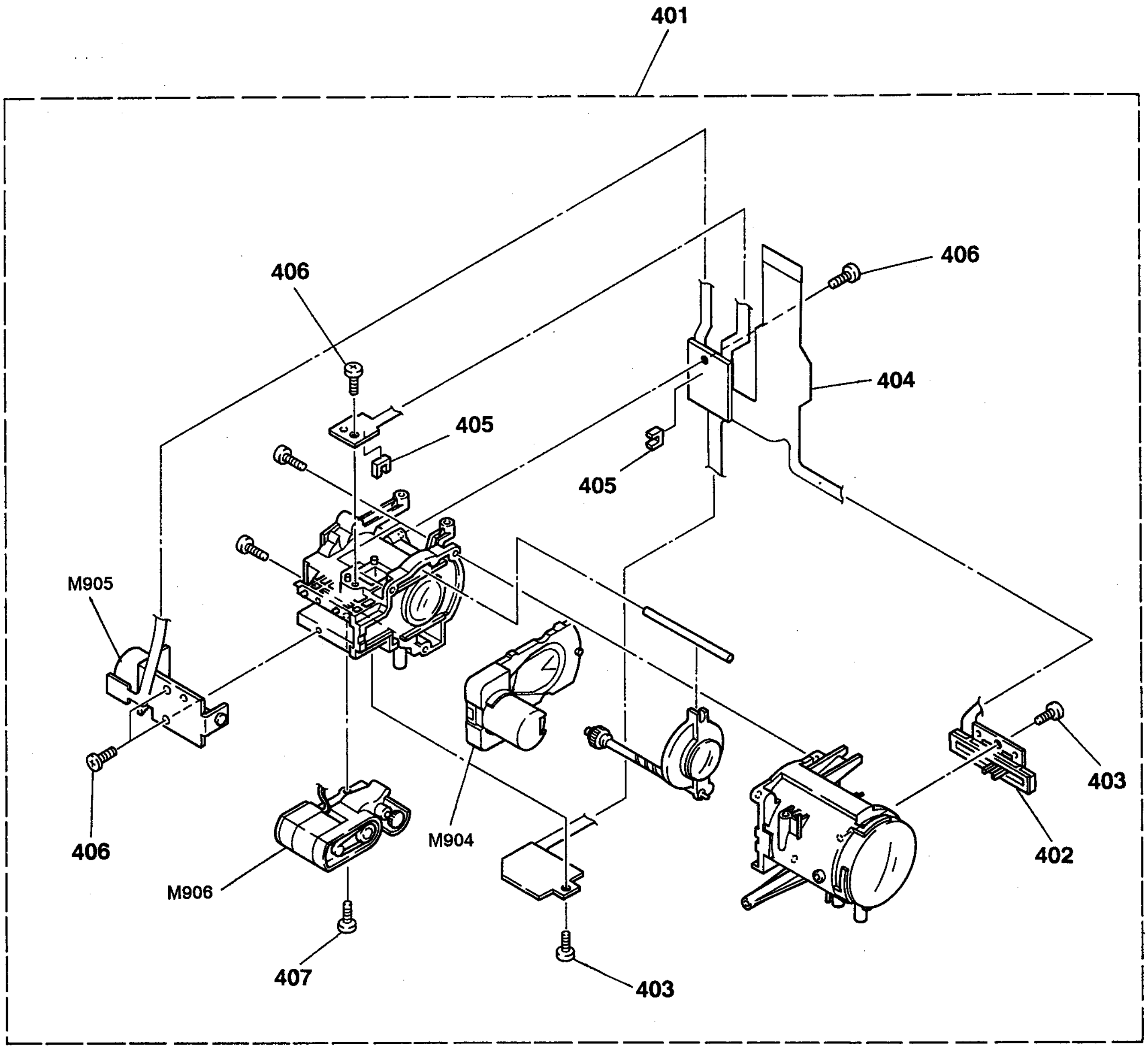
322

Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-02	CAM	
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
315	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
322	1-641-643-12	FP-444 FLEXIBLE BOARD	
323	3-945-756-01	SCREW (M1.4X3)	
324	1-691-254-13	CONNECTOR, TRANSLATION 10P	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

5-8. ZOOM LENS ASSEMBLY (VCL-6210WC)


401
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M905
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M904
M906
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403

Ref. No.	Part No.	Description	Remark
401	1-547-548-11	LENS, ZOOM (VCL-6210WC)	
402	3-708-446-01	METER, POTENTIAL	
403	3-708-053-01	SCREW, FB FITTING	
404	3-708-493-01	FLEXIBLE	
405	3-708-435-01	PHOTO INTERRUPTER	
406	3-707-946-01	SCREW	
407	3-708-450-01	SCREW, PZ	
M904	3-708-494-01	METER ASSY, IG (IRIS)	
M905	3-708-491-01	MOTOR ASSY, STEPPING (FOCUS)	
M906	3-708-492-01	MOTOR ASSY, PZ (ZOOM)	

SECTION 6
ELECTRICAL PARTS LIST

AU-150

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description			Remark
*	A-7063-579-A	AU-150 BOARD, COMPLETE **********************			
		(Ref. No. 2,000 Series)			
		< CAPACITOR >			
C605	1-164-634-11	CERAMIC CHIP	1uF		16V
C606	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C607	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C608	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C609	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C611	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C612	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C613	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C615	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C616	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C617	1-164-634-11	CERAMIC CHIP	1uF		16V
C618	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C619	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C620	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C621	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C623	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C624	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C625	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C626	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C627	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C628	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C629	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C630	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C631	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C633	1-164-634-11	CERAMIC CHIP	1uF		16V
C634	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C635	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C636	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C637	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C638	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C640	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C641	1-126-209-11	ELECT CHIP	100uF	20%	4V
C642	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C643	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C645	1-126-209-11	ELECT CHIP	100uF	20%	4V
C646	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C647	1-164-634-11	CERAMIC CHIP	1uF		16V
C648	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C649	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C650	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C651	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C653	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C654	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C655	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C656	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C657	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C658	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C660	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C661	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C662	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C663	1-164-634-11	CERAMIC CHIP	1uF		16V
C664	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C666	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C668	1-126-209-11	ELECT CHIP	100uF	20%	4V
C670	1-164-634-11	CERAMIC CHIP	1uF		16V
C672	1-162-638-11	CERAMIC CHIP	1uF		16V
C673	1-162-638-11	CERAMIC CHIP	1uF		16V
C674	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C675	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C676	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C677	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C678	1-135-202-21	TANTALUM CHIP	22uF	20%	4V
C679	1-135-202-21	TANTALUM CHIP	22uF	20%	4V
C680	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C681	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C683	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C684	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C687	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C688	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C689	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C690	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C691	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C692	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C694	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C695	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C696	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
CN601	1-695-883-12	CONNECTOR, BOARD TO BOARD 32P			
CN602	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P			
* CN603	1-580-055-21	PIN, CONNECTOR 2P			

< FILTER >

Ref. No.	Part No.	Description	Remark
FL601	1-236-837-21	FILTER, BAND PASS	
FL602	1-236-838-21	FILTER, BAND PASS	

< IC >

Ref. No.	Part No.	Description	Remark
IC601	8-759-823-19	IC CXA1488R	
IC602	8-759-823-19	IC CXA1488R	
IC603	8-759-823-21	IC CXA1536Q	
IC604	8-759-062-66	IC TC7S66F	
IC605	8-749-923-29	IC RS-20E-T	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q601	8-729-823-00	TRANSISTOR 2SA1622-5.6.7	
Q603	8-729-402-81	TRANSISTOR XN4501	
Q604	8-729-402-81	TRANSISTOR XN4501	
Q605	8-729-905-18	TRANSISTOR DTC144EU	
Q606	8-729-402-81	TRANSISTOR XN4501	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R601	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R603	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R604	1-216-801-11	METAL CHIP 22 5% 1/16W	
R605	1-216-859-11	METAL CHIP 1.5M 5% 1/16W	
R606	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R607	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R609	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R611	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R613	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R614	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R617	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R619	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R620	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R622	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R623	1-216-859-11	METAL CHIP 1.5M 5% 1/16W	
R624	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R625	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R626	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R627	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R632	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R633	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R634	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R635	1-216-817-11	METAL CHIP 470 5% 1/16W	
R637	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R639	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R640	1-216-848-11	METAL CHIP 180K 5% 1/16W	
R642	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R643	1-216-817-11	METAL CHIP 470 5% 1/16W	
R645	1-216-813-11	METAL CHIP 220 5% 1/16W	
R646	1-216-819-11	METAL CHIP 680 5% 1/16W	
R647	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R649	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R651	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R652	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R653	1-218-714-11	METAL CHIP 8.2K 0.50% 1/16W	
R654	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R655	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R656	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R657	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R658	1-218-706-11	METAL CHIP 3.9K 0.50% 1/16W	
R659	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R661	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R662	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R663	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R664	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R666	1-216-820-11	METAL CHIP 820 5% 1/16W	
R667	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R668	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R669	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R670	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R672	1-216-864-11	METAL CHIP 0 5% 1/16W	

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* A-7063-575-A CD-106 BOARD, COMPLETE

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(Ref. No. 1,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C875	1-135-214-21	TANTALUM CHIP 4.7uF 20% 20V	
C876	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C877	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C879	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
C880	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
C881	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C882	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C883	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C884	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C888	1-135-210-11	TANTALUM CHIP 4.7uF 20% 10V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN875	1-573-308-11	CONNECTOR, BOARD TO BOARD 16P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D875	8-719-800-76	DIODE 1SS226	
D876	8-719-404-46	DIODE MA110	
D877	8-719-820-05	DIODE 1SS181	
D878	8-719-404-46	DIODE MA110	

< COIL >

Ref. No.	Part No.	Description	Remark
L875	1-412-064-11	INDUCTOR CHIP 100uH	

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
Q875	8-729-425-64	TRANSISTOR 2SD2216Q	
Q876	8-729-427-72	TRANSISTOR XP4501	
Q877	8-729-232-86	TRANSISTOR 2SK1875	
		< RESISTOR >	
R877	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R878	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R879	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R880	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R881	1-216-819-11	METAL CHIP 680 5% 1/16W	
R882	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R883	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R884	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R885	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R886	1-216-809-11	METAL CHIP 100 5% 1/16W	
R887	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	

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* A-7071-831-A CF-34 BOARD, COMPLETE

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(Ref. No. 7,000 Series)

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN993	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
		< DIODE >	
D992	8-719-404-46	DIODE MA110	
		< RESISTOR >	
R991	1-216-295-00	METAL CHIP 0 5% 1/10W	
R992	1-216-295-00	METAL CHIP 0 5% 1/10W	
		< SWITCH >	
S991	1-692-111-11	SWITCH, KEY BOARD (FADER)	
S993	1-692-111-11	SWITCH, KEY BOARD (DATE (+))	
S995	1-692-111-11	SWITCH, KEY BOARD (COUNTER RESET)	
S996	1-692-111-11	SWITCH, KEY BOARD (TIME (NEXT))	
S997	1-692-024-21	SWITCH, ROTARY (PROGRAM AE)	
		< BUZZER >	
SP991	1-529-107-11	BUZZER, PIEZOELECTRIC	
		< FLEXIBLE BOARD >	
W991	1-696-483-11	CABLE, FLAT (FFC-86)	

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* A-7071-835-A CN-73 BOARD, COMPLETE

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(Ref. No. 6,000 Series)

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN518	1-573-310-11	CONNECTOR, BOARD TO BOARD 20P	

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⚠ A-7063-580-A DD-56 BOARD, COMPLETE

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(Ref. No. 1,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C901	1-164-218-11	CERAMIC CHIP 180PF 0.25PF 50V	
C902	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C903	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C904	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C906	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C907	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C909	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C910	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C911	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C912	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V	
C914	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C915	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C916	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C917	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C918	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C919	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C920	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C921	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C922	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C923	1-135-215-21	TANTALUM CHIP 6.8uF 20% 16V	
C924	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C925	1-165-178-11	CERAMIC CHIP 6.8uF 16V	
C926	1-135-215-21	TANTALUM CHIP 6.8uF 20% 16V	
C927	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C928	1-165-178-11	CERAMIC CHIP 6.8uF 16V	
C929	1-165-178-11	CERAMIC CHIP 6.8uF 16V	
C931	1-165-178-11	CERAMIC CHIP 6.8uF 16V	
C932	1-165-178-11	CERAMIC CHIP 6.8uF 16V	
C933	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C934	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C935	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C936	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C938	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C939	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C940	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C942	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C943	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
C944	1-128-004-11	ELECT CHIP 10uF 20%	16V
C946	1-128-004-11	ELECT CHIP 10uF 20%	16V
C947	1-128-004-11	ELECT CHIP 10uF 20%	16V
C948	1-128-004-11	ELECT CHIP 10uF 20%	16V
C949	1-128-004-11	ELECT CHIP 10uF 20%	16V
C950	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN901	1-695-324-11	CONNECTOR, BOARD TO BOARD 42P	
CN902	1-573-506-41	CONNECTOR, FPC (NON ZIF) 4P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D901	8-719-981-59	DIODE FC805	
D905	8-719-404-46	DIODE MA110	
D906	8-719-404-46	DIODE MA110	

< FUSE >

Ref. No.	Part No.	Description	Remark
⚠F901	1-532-778-21	FUSE, MICRO (1.6A 125V)	
⚠F902	1-532-778-21	FUSE, MICRO (1.6A 125V)	

< IC >

Ref. No.	Part No.	Description	Remark
IC901	8-759-060-94	IC MB3785APFV-G-BND-ER	

< JACK >

Ref. No.	Part No.	Description	Remark
J901	1-537-281-41	TERMINAL BOARD (BATTERY TERMINAL)	
J902	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	

< COIL >

Ref. No.	Part No.	Description	Remark
L903	1-424-522-21	COIL, CHOKE 10uH	
L904	1-424-522-21	COIL, CHOKE 10uH	
L905	1-424-522-21	COIL, CHOKE 10uH	
L906	1-424-523-21	COIL, CHOKE 22uH	
L908	1-412-028-11	INDUCTOR CHIP 4.7uH	
L909	1-412-028-11	INDUCTOR CHIP 4.7uH	
L910	1-412-028-11	INDUCTOR CHIP 4.7uH	
L911	1-412-028-11	INDUCTOR CHIP 4.7uH	
L912	1-424-524-21	COIL, CHOKE 47uH	
L913	1-424-524-21	COIL, CHOKE 47uH	
L914	1-412-034-11	INDUCTOR CHIP 330uH	
L915	1-412-034-11	INDUCTOR CHIP 330uH	
L916	1-412-028-11	INDUCTOR CHIP 4.7uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q901	8-729-403-27	TRANSISTOR XN4401	
Q902	8-729-402-42	TRANSISTOR UN5213	
Q903	8-729-823-84	TRANSISTOR FP102	
Q904	8-729-804-41	TRANSISTOR 2SB1122-S	
Q905	8-729-823-82	TRANSISTOR FP101	
Q906	8-729-823-82	TRANSISTOR FP101	
Q907	8-729-402-81	TRANSISTOR XN4501	
Q908	8-729-805-25	TRANSISTOR 2SB1121-S	
Q909	8-729-805-25	TRANSISTOR 2SB1121-S	
Q910	8-729-403-35	TRANSISTOR UN5113	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R901	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R902	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R903	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R904	1-218-698-11	METAL CHIP 1.8K 0.50% 1/16W	
R905	1-218-724-11	METAL CHIP 22K 0.50% 1/16W	
R906	1-218-708-11	METAL CHIP 4.7K 0.50% 1/16W	
R907	1-216-818-11	METAL CHIP 560 5% 1/16W	
R908	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R909	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R910	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R911	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R912	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R914	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R915	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R916	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R917	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R918	1-216-811-11	METAL CHIP 150 5% 1/16W	
R919	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R920	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R921	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R922	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R923	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R924	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R925	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R926	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R927	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R928	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R929	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R930	1-216-182-00	METAL CHIP 220 5% 1/8W	
R931	1-216-182-00	METAL CHIP 220 5% 1/8W	
R932	1-216-182-00	METAL CHIP 220 5% 1/8W	
R933	1-216-194-00	METAL CHIP 680 5% 1/8W	
R935	1-216-864-11	METAL CHIP 0 5% 1/16W	
R936	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R937	1-216-864-11	METAL CHIP 0 5% 1/16W	
R938	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R939	1-218-883-11	METAL CHIP 33K 0.50% 1/16W	
R940	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R941	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R942	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R943	1-216-296-00	METAL CHIP 0 5% 1/8W	
R944	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R945	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R946	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R947	1-216-295-00	METAL CHIP 0 5% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
R949	1-216-296-00	METAL CHIP	0	5%	1/8W
R950	1-216-864-11	METAL CHIP	0	5%	1/16W
R951	1-216-296-00	METAL CHIP	0	5%	1/8W
R952	1-216-864-11	METAL CHIP	0	5%	1/16W

< SWITCH >

S901	1-572-467-11	SWITCH, PUSH (1 KEY) (EJECT)

< TRASFORMER >

T901	1-450-874-21	TRANSFORMER, DC-DC CONVERTER

****

* A-7071-832-A ED-37 BOARD, COMPLETE

****

(Ref. No. 8,000 Series)

< DIODE >

D986	8-719-404-46	DIODE	MA110
D987	8-719-404-40	DIODE	MA121
D988	8-719-420-14	DIODE	MA8082-M
D989	8-719-420-14	DIODE	MA8082-M
D990	8-719-420-14	DIODE	MA8082-M

< SWITCH >

S986	1-571-275-41	SWITCH, SLIDE (BEEP)
S987	1-692-111-11	SWITCH, KEY BOARD (SUMMER TIME/DST)
S988	1-571-275-41	SWITCH, SLIDE (REMOTE COMMANDER)
S989	1-692-111-11	SWITCH, KEY BOARD (AREA)
S990	1-571-275-41	SWITCH, SLIDE (EDIT)

< FLEXIBLE BOARD >

W986	1-696-621-11	FP-590 FLEXIBLE BOARD

****

* A-7063-581-A JK-99 BOARD, COMPLETE

****

(Ref. No. 3,000 Series)

< JACK >

J517	1-569-556-11	JACK (VIDEO/AUDIO OUT)

< FLEXIBLE BOARD >

W517	1-751-165-11	CABLE, FLAT (FFC-100)

****

Ref. No.	Part No.	Description	Remark
*	A-7071-829-A	LI-46 BOARD, COMPLETE	

****

(Ref. No. 4,000 Series)

< CONNECTOR >

* CN516	1-580-055-21	PIN, CONNECTOR 2P

< HOLDER >

H516	1-550-104-32	HOLDER, BATTERY (LITHIUM)

****

LS-33 BOARD (Ref. No. 9,000 Series)

****

< DIODE >

D001	8-719-989-52	DIODE	GL4600S
H001	8-719-987-62	DIODE	LT140SAZ
H002	8-719-987-62	DIODE	LT140SAZ

< TRANSISTOR >

Q001	8-729-012-46	TRANSISTOR	PT4600FS
Q002	8-729-012-46	TRANSISTOR	PT4600FS

< RESISTOR >

R003	1-216-033-00	METAL CHIP	220	5%	1/10W
R004	1-216-033-00	METAL CHIP	220	5%	1/10W
R010	1-216-033-00	METAL CHIP	220	5%	1/10W
R011	1-216-033-00	METAL CHIP	220	5%	1/10W

< SWITCH >

S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP HG)

****

* A-7063-582-A MA-170 BOARD, COMPLETE

****

(Ref. No. 2,000 Series)

< CAPACITOR >

C551	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C552	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C556	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C557	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C558	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C559	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C561	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C562	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C563	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C564	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description	Remark
C566	1-126-205-11	ELECT CHIP 47uF 20%	6.3V
C567	1-164-633-11	CERAMIC CHIP 0.1uF 10%	25V
C568	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C569	1-135-091-00	TANTALUM CHIP 1uF 20%	16V
C570	1-164-343-11	CERAMIC CHIP 0.056uF 10%	25V
C571	1-162-587-91	CERAMIC CHIP 0.039uF 10%	25V
C572	1-163-020-00	CERAMIC CHIP 0.0082uF 10%	50V
C573	1-163-016-00	CERAMIC CHIP 0.0039uF 10%	50V
C574	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C575	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C577	1-164-360-11	CERAMIC CHIP 0.1uF	16V
C578	1-164-633-11	CERAMIC CHIP 0.1uF 10%	25V
C579	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C580	1-135-091-00	TANTALUM CHIP 1uF 20%	16V
C581	1-164-343-11	CERAMIC CHIP 0.056uF 10%	25V
C582	1-162-587-91	CERAMIC CHIP 0.039uF 10%	25V
C583	1-163-016-00	CERAMIC CHIP 0.0039uF 10%	50V
C584	1-163-020-00	CERAMIC CHIP 0.0082uF 10%	50V
C585	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C586	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V

< CONNECTOR >

CN551	1-691-550-11	PIN, CONNECTOR (1.5MM)(SMD) 3P	
CN552	1-691-550-11	PIN, CONNECTOR (1.5MM)(SMD) 3P	
CN553	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	

< DIODE >

D551	8-719-404-46	DIODE MA110	
D552	8-719-404-46	DIODE MA110	

< IC >

IC551	8-759-062-23	IC CXA1618N-E2	
IC553	8-759-998-98	IC LM358D	

< JACK >

J551	1-691-737-11	JACK, SMALL (MIC)	

< COIL >

L501	1-410-994-11	INDUCTOR CHIP 1.2uH	
L502	1-410-994-11	INDUCTOR CHIP 1.2uH	
L503	1-410-994-11	INDUCTOR CHIP 1.2uH	

< TRANSISTOR >

Q551	8-729-010-80	TRANSISTOR FC13	
Q555	8-729-822-97	TRANSISTOR 2SC4211-5.6.7	

< RESISTOR >

R551	1-216-822-11	METAL CHIP 1.2K 5%	1/16W
R552	1-216-822-11	METAL CHIP 1.2K 5%	1/16W
R553	1-216-831-11	METAL CHIP 6.8K 5%	1/16W
R554	1-216-831-11	METAL CHIP 6.8K 5%	1/16W
R555	1-216-841-11	METAL CHIP 47K 5%	1/16W
R556	1-216-841-11	METAL CHIP 47K 5%	1/16W
R557	1-216-841-11	METAL CHIP 47K 5%	1/16W
R558	1-216-845-11	METAL CHIP 100K 5%	1/16W
R559	1-216-831-11	METAL CHIP 6.8K 5%	1/16W
R560	1-216-857-11	METAL CHIP 1M 5%	1/16W
R561	1-216-837-11	METAL CHIP 22K 5%	1/16W
R566	1-216-854-11	METAL CHIP 560K 5%	1/16W
R567	1-216-864-11	METAL CHIP 0 5%	1/16W
R568	1-216-857-11	METAL CHIP 1M 5%	1/16W
R569	1-216-857-11	METAL CHIP 1M 5%	1/16W
R570	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R571	1-216-833-11	METAL CHIP 10K 5%	1/16W
R572	1-216-833-11	METAL CHIP 10K 5%	1/16W
R573	1-216-835-11	METAL CHIP 15K 5%	1/16W
R574	1-216-864-11	METAL CHIP 0 5%	1/16W
R575	1-216-837-11	METAL CHIP 22K 5%	1/16W
R576	1-216-839-11	METAL CHIP 33K 5%	1/16W
R577	1-216-836-11	METAL CHIP 18K 5%	1/16W
R580	1-216-833-11	METAL CHIP 10K 5%	1/16W
R581	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R582	1-216-833-11	METAL CHIP 10K 5%	1/16W
R583	1-216-864-11	METAL CHIP 0 5%	1/16W
R584	1-216-835-11	METAL CHIP 15K 5%	1/16W
R585	1-216-833-11	METAL CHIP 10K 5%	1/16W
R586	1-216-837-11	METAL CHIP 22K 5%	1/16W
R587	1-216-839-11	METAL CHIP 33K 5%	1/16W
R588	1-216-836-11	METAL CHIP 18K 5%	1/16W
R593	1-216-821-11	METAL CHIP 1K 5%	1/16W
R594	1-216-821-11	METAL CHIP 1K 5%	1/16W

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* A-7071-834-A MF-214 BOARD, COMPLETE
****

(Ref. No. 5,000 Series)

< DIODE >

D971	8-719-404-46	DIODE MA110	

< SWITCH >

S971	1-692-088-41	SWITCH, TACTILE (FOCUS)	
S972	1-241-865-11	RES, VAR, CARBON 10K (MANUAL FOCUS RING)	
S973	1-572-467-11	SWITCH, PUSH (1 KEY) (LENS COVER)	

< FLEXIBLE BOARD >

W971	1-696-484-11	CABLE, FLAT (FFC-87)	

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* A-7063-578-A SL-33 BOARD, COMPLETE
****
(Ref. No. 5,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C521	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C522	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C524	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C525	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C526	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C527	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
		< CONNECTOR >	
CN521	1-691-482-21	CONNECTOR, FFC/FPC 15P	
CN522	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN523	1-691-473-21	CONNECTOR, FFC/FPC 7P	
		< IC >	
IC521	8-759-059-09	IC LB8111V	
		< TRANSISTOR >	
Q521	8-729-402-81	TRANSISTOR XN4501	
		< RESISTOR >	
R522	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R523	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R524	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R525	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R528	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R530	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R532	1-216-174-00	METAL CHIP 100 5% 1/8W	
R533	1-216-864-11	METAL CHIP 0 5% 1/16W	
		< NETWORK, RES >	
RB521	1-236-424-11	NETWORK, RES 10K	
RB522	1-236-424-11	NETWORK, RES 10K	
		< FLEXIBLE BOARD >	
W521	1-642-186-11	FP-437 FLEXIBLE BOARD	
W522	1-696-490-11	FP-589 FLEXIBLE BOARD	

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* A-7071-828-A SW-223 BOARD, COMPLETE
****
(Ref. No. 7,000 Series)

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S519	1-553-977-00	SWITCH, SLIDE (STANDBY)	
S520	1-571-315-11	SWITCH, KEY BOARD (START/STOP)	
		< FLEXIBLE BOARD >	
W519	1-696-488-11	CABLE, FLAT (FFC-92)	

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* A-7063-577-A VC-133 BOARD, COMPLETE
****
(Ref. No. 3,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C701	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C702	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C703	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C705	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C707	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C708	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C710	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C711	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C712	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C713	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C714	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C716	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C718	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C719	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C721	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C722	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C723	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C724	1-164-634-11	CERAMIC CHIP 1uF 16V	
C725	1-135-259-11	TANTALUM CHIP 10uF 20% 6.3V	
C726	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C727	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C728	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C729	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C730	1-162-971-11	CERAMIC CHIP 0.001uF 50V	
C731	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C734	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C735	1-162-971-11	CERAMIC CHIP 0.001uF 50V	
C736	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C737	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C738	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C739	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C741	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C742	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C745	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C750	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C751	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C752	1-162-946-11	CERAMIC CHIP 27PF 5% 50V	
C801	1-135-259-11	TANTALUM CHIP 10uF 20% 6.3V	
C802	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C803	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	

VC-133

Ref.No.	Part No.	Description				Remark
C804	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C805	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C806	1-162-971-11	CERAMIC CHIP	0.001uF		50V	
C807	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C808	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C809	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C810	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C811	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C813	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C814	1-162-971-11	CERAMIC CHIP	0.001uF		50V	
C815	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C816	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C817	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C819	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C820	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C823	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C824	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C826	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C827	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C830	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C832	1-162-971-11	CERAMIC CHIP	0.001uF		50V	
C833	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C834	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C835	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C836	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C837	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C838	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C839	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C841	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C851	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C852	1-162-971-11	CERAMIC CHIP	0.001uF		50V	
C853	1-164-634-11	CERAMIC CHIP	1uF		16V	
C854	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C855	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C856	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C857	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C858	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C859	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C860	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C861	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C862	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C863	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C864	1-162-638-11	CERAMIC CHIP	1uF		16V	
C866	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C868	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C869	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V	
C870	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C871	1-164-634-11	CERAMIC CHIP	1uF		16V	

Ref.No.	Part No.	Description	Remark
		< CONNECTOR >	
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN801	1-573-336-11	CONNECTOR, BOARD TO BOARD 16P	
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P	
		< TRIMMER >	
CT801	1-141-356-11	CAP, ADJ	
		< FILTER >	
FL701	1-236-834-21	FILTER, LOW PASS	
FL702	1-415-751-21	DELAY LINE, LC (YH)	
		< IC >	
IC702	8-759-064-36	IC MB88346BPFV	
IC703	8-759-710-07	IC NJM2234M	
IC704	8-752-348-92	IC CXD2101AR	
IC705	8-759-063-18	IC 27C512-RCP-V1.0	
IC706	8-752-355-56	IC CXD2104BN	
IC707	8-752-337-32	IC CXD2100Q	
IC709	8-752-840-64	IC CXP80624-434R	
IC712	8-759-073-67	IC BR9021AF	
IC801	8-752-350-16	IC CXD1257AR	
IC802	8-752-056-39	IC CXA1507BR	
IC803	8-752-053-26	IC CXA1399Q	
IC804	8-752-327-48	IC CXD1250N	
IC805	8-752-054-61	IC CXA1390AR	
IC851	8-759-701-24	IC NJM3414M	
IC852	8-759-998-96	IC LM324D	
IC853	8-759-058-47	IC MPC1724VM	
IC854	8-759-823-51	IC LB1830M	
IC856	8-759-998-98	IC LM358D	
		< COIL >	
L701	1-412-006-31	INDUCTOR CHIP 10uH	
L703	1-412-052-21	INDUCTOR CHIP 1uH	
L704	1-412-006-31	INDUCTOR CHIP 10uH	
L705	1-412-979-21	INDUCTOR 1uH	
L706	1-412-062-11	INDUCTOR CHIP 47uH	
L708	1-412-979-21	INDUCTOR 1uH	
L710	1-412-052-21	INDUCTOR CHIP 1uH	
L711	1-412-058-11	INDUCTOR CHIP 10uH	
L712	1-412-052-21	INDUCTOR CHIP 1uH	
L714	1-412-006-31	INDUCTOR CHIP 10uH	
L715	1-412-058-11	INDUCTOR CHIP 10uH	
L717	1-412-058-11	INDUCTOR CHIP 10uH	
L720	1-412-006-31	INDUCTOR CHIP 10uH	
L721	1-410-391-11	INDUCTOR CHIP 68uH	
L801	1-412-029-11	INDUCTOR CHIP 10uH	
L802	1-412-006-31	INDUCTOR CHIP 10uH	

Ref. No.	Part No.	Description	Remark
L803	1-412-058-11	INDUCTOR CHIP 10uH	
L804	1-412-058-11	INDUCTOR CHIP 10uH	
L851	1-412-058-11	INDUCTOR CHIP 10uH	
L853	1-412-031-11	INDUCTOR CHIP 47uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q701	8-729-928-87	TRANSISTOR DTC124EE	
Q702	8-729-427-74	TRANSISTOR XP4601	
Q703	8-729-427-74	TRANSISTOR XP4601	
Q704	8-729-425-50	TRANSISTOR 2SB1462Q	
Q706	8-729-425-64	TRANSISTOR 2SD2216Q	
Q707	8-729-428-84	TRANSISTOR UN9111	
Q708	8-729-425-64	TRANSISTOR 2SD2216Q	
Q709	8-729-427-72	TRANSISTOR XP4501	
Q801	8-729-425-64	TRANSISTOR 2SD2216Q	
Q802	8-729-427-70	TRANSISTOR XP4401	
Q851	8-729-425-64	TRANSISTOR 2SD2216Q	
Q852	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q853	8-729-427-70	TRANSISTOR XP4401	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R701	1-216-864-11	METAL CHIP 0 5% 1/16W	
R702	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R703	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R704	1-216-815-11	METAL CHIP 330 5% 1/16W	
R705	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R707	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R708	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R709	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R711	1-216-864-11	METAL CHIP 0 5% 1/16W	
R712	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R713	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R714	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R715	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R716	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R718	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R720	1-216-864-11	METAL CHIP 0 5% 1/16W	
R721	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R722	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R724	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R725	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R727	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R728	1-216-813-11	METAL CHIP 220 5% 1/16W	
R729	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R730	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R732	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R733	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R734	1-216-817-11	METAL CHIP 470 5% 1/16W	
R735	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R736	1-216-864-11	METAL CHIP 0 5% 1/16W	
R738	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R739	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R742	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R744	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R745	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R747	1-216-864-11	METAL CHIP 0 5% 1/16W	
R749	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R750	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R751	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R752	1-216-817-11	METAL CHIP 470 5% 1/16W	
R753	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R754	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R755	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R756	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R757	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R758	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R759	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R760	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R761	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R762	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R769	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R770	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R771	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R772	1-216-864-11	METAL CHIP 0 5% 1/16W	
R773	1-216-864-11	METAL CHIP 0 5% 1/16W	
R775	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R776	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R777	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R778	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R779	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R781	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R782	1-216-813-11	METAL CHIP 220 5% 1/16W	
R784	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R785	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R787	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R791	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R792	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R793	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R794	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R795	1-216-815-11	METAL CHIP 330 5% 1/16W	
R796	1-216-817-11	METAL CHIP 470 5% 1/16W	
R797	1-216-818-11	METAL CHIP 560 5% 1/16W	
R802	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R803	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R804	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R805	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R806	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R807	1-216-817-11	METAL CHIP 470 5% 1/16W	
R808	1-216-801-11	METAL CHIP 22 5% 1/16W	
R809	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R810	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R812	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R813	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R816	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R819	1-216-805-11	METAL CHIP 47 5% 1/16W	
R821	1-216-863-11	METAL CHIP 3.3M 5% 1/16W	
R823	1-218-721-11	METAL CHIP 16K 0.50% 1/16W	
R825	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R826	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R827	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R828	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R829	1-218-744-11	METAL CHIP 150K 0.50% 1/16W	
R830	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R851	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R852	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R853	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R854	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R855	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R856	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R857	1-216-848-11	METAL CHIP 180K 5% 1/16W	
R858	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R859	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R860	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R861	1-218-724-11	METAL CHIP 22K 0.50% 1/16W	
R862	1-216-848-11	METAL CHIP 180K 5% 1/16W	
R863	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R864	1-216-134-00	METAL CHIP 2.2 5% 1/8W	
R865	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R866	1-216-820-11	METAL CHIP 820 5% 1/16W	
R867	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R868	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R869	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R870	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R871	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R872	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R873	1-216-814-11	METAL CHIP 270 5% 1/16W	
R874	1-216-842-11	METAL CHIP 56K 5% 1/16W	

< NETWORK, RES >

RB701	1-236-420-11	NETWORK, RES 4.7K	
RB702	1-236-432-11	NETWORK, RES 47K	
RB703	1-236-412-11	NETWORK, RES 1.0K	
RB704	1-236-416-11	NETWORK, RES 2.2K	
RB705	1-236-416-11	NETWORK, RES 2.2K	
RB706	1-236-412-11	NETWORK, RES 1.0K	
RB707	1-236-412-11	NETWORK, RES 1.0K	
RB708	1-236-412-11	NETWORK, RES 1.0K	

< VIBRATOR >

X701	1-579-553-11	VIBRATOR (12MHz)	
X801	1-579-619-11	VIBRATOR, CRYSTAL (28.6363MHz)	

Ref. No.	Part No.	Description	Remark

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*	A-7063-183-A	VF-42 BOARD, COMPLETE	

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(Ref. No. 1,000 Series)

	3-942-888-01	HOLDER, LED	

< CAPACITOR >

C501	1-126-176-11	ELECT 220uF 20% 10V	
C502	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C503	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
⚠C504	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
⚠C505	1-164-713-11	CERAMIC CHIP 0.0056uF 5% 50V	
⚠C506	1-164-713-11	CERAMIC CHIP 0.0056uF 5% 50V	
C507	1-127-515-11	ELECT(SOLID) 47uF 20% 6.3V	
C508	1-164-611-11	CERAMIC CHIP 0.001uF 10% 500V	
C509	1-124-257-00	ELECT 2.2uF 20% 50V	
C510	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C511	1-126-090-11	ELECT 82uF 20% 10V	
C512	1-137-306-11	FILM CHIP 0.1uF 5% 16V	
C513	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C514	1-131-381-00	TANTALUM 47uF 10% 10V	
C515	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C516	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	

< CONNECTOR >

* CN501	1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P	
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	

< DIODE >

D501	8-719-820-65	LED TLS221	
D502	8-719-984-02	LED BR4371F	
D503	8-719-400-20	DIODE MA152WA	

< IC >

IC501	8-759-420-01	IC AN2512S	

< COIL >

L501	1-408-976-21	INDUCTOR 33uH	
L502	1-408-785-21	INDUCTOR CHIP 47uH	
⚠L503	1-459-876-41	COIL, FERRITE (HLC)	

< TRANSISTOR >

Q501	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q502	8-729-216-31	TRANSISTOR 2SA1163-G	
⚠Q503	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q504	8-729-106-68	TRANSISTOR 2SD1615A-GP	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R501	1-216-033-00	METAL CHIP 220 5% 1/10W	
R502	1-216-041-00	METAL CHIP 470 5% 1/10W	
R503	1-216-041-00	METAL CHIP 470 5% 1/10W	
⚠R504	1-216-324-11	METAL CHIP 10K 1% 1/10W	
⚠R505	1-218-150-11	METAL CHIP 1.2K 1% 1/10W	
R506	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R507	1-216-047-00	METAL CHIP 820 5% 1/10W	
R508	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R509	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R510	1-216-005-00	METAL CHIP 15 5% 1/10W	
R511	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R512	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R513	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R515	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R516	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R517	1-216-025-00	METAL CHIP 100 5% 1/10W	
R518	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R519	1-216-336-11	METAL CHIP 47K 1% 1/10W	
R520	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R521	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R522	1-216-160-00	METAL CHIP 27 5% 1/8W	
R523	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R524	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R525	1-216-097-00	METAL CHIP 100K 5% 1/10W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV501	1-238-092-11	RES, ADJ, CERMET 47K	
RV502	1-238-086-11	RES, ADJ, CERMET 470	
RV503	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV504	1-228-762-00	RES, ADJ, METAL CHIP 1M	

< TRASFORMER >

Ref. No.	Part No.	Description	Remark
⚠T501	1-439-486-11	TRANSFORMER ASSY, FLYBACK	

< THERMISTOR >

Ref. No.	Part No.	Description	Remark
TH501	1-809-350-21	THERMISTOR, NTC (2125)	

< SOCKET >

Ref. No.	Part No.	Description	Remark
⚠W501	1-540-019-21	SOCKET ASSY, CRT	

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* A-7071-833-A VK-32 BOARD, COMPLETE
****
(Ref. No. 9,000 Series)

< DIODE >

Ref. No.	Part No.	Description	Remark
D976	8-719-404-46	DIODE MA110	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S976	1-572-921-31	SWITCH, KEY BOARD (STOP ■)	
S977	1-692-260-11	SWITCH, SLIDE (POWER)	
S978	1-572-921-31	SWITCH, KEY BOARD (EDIT SEARCH -)	
S979	1-572-921-31	SWITCH, KEY BOARD (REW ◀◀)	
S980	1-572-921-31	SWITCH, KEY BOARD (PB ▷)	
S981	1-572-921-31	SWITCH, KEY BOARD (EDIT SEARCH +)	
S983	1-572-921-31	SWITCH, KEY BOARD (FF ▶▶)	
S984	1-572-921-31	SWITCH, KEY BOARD (PAUSE ▮▮)	

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description	Remark
W987	1-696-622-11	FP-591 FLEXIBLE BOARD	

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* A-7063-576-A VS-100 BOARD, COMPLETE
****
(Ref. No. 4,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C001	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C002	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C003	1-162-955-11	CERAMIC CHIP 150PF 5% 50V	
C004	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C005	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C006	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C009	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C010	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C011	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C012	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C013	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C014	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C018	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C019	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C020	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C021	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C022	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C023	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C024	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C025	1-135-259-11	TANTALUM CHIP 10uF 20% 6.3V	
C026	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C027	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C028	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C029	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C030	1-135-259-11	TANTALUM CHIP 10uF 20% 6.3V	
C035	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C049	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C057	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C058	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C059	1-162-974-11	CERAMIC CHIP 0.01uF 50V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
C061	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C063	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C064	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C065	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C066	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C067	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C068	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C069	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C072	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C073	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C074	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C075	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C076	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C077	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C080	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C081	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C082	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C083	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C085	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C091	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C092	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C150	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C151	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C156	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C159	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C161	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C167	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C170	1-162-568-11	CERAMIC CHIP	0.33uF		25V
C171	1-162-638-11	CERAMIC CHIP	1uF		16V
C173	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C175	1-128-004-11	ELECT CHIP	10uF	20%	16V
C176	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C177	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C178	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C179	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C180	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C181	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C182	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C187	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C192	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C194	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C199	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C205	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C206	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C207	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C208	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C209	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C213	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C214	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C216	1-128-004-11	ELECT CHIP	10uF	20%	16V
C217	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C218	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C219	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C220	1-126-246-11	ELECT CHIP	220uF	20%	4V
C221	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C222	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C223	1-128-004-11	ELECT CHIP	10uF	20%	16V
C225	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C226	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C227	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C228	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C229	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C230	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C231	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C232	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C233	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C234	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C235	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C236	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C237	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C238	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C239	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C240	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C241	1-126-607-11	ELECT CHIP	47uF	20%	4V
C242	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C246	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C247	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C248	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C249	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C250	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C254	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C255	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C256	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C257	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C259	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C260	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C261	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C262	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C263	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C264	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C265	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C266	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C267	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C268	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C271	1-128-004-11	ELECT CHIP	10uF	20%	16V
C272	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C273	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C274	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C275	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C278	1-162-638-11	CERAMIC CHIP	1uF		16V

Ref. No.	Part No.	Description			Remark
C279	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C280	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C281	1-135-146-21	TANTALUM CHIP	0.68uF	20%	25V
C282	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C283	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C284	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C285	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C286	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C288	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C289	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C290	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C292	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C294	1-162-638-11	CERAMIC CHIP	1uF		16V
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C297	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C299	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C300	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C301	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C303	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C305	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C306	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C307	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C308	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C401	1-164-346-11	CERAMIC CHIP	1uF		16V
C402	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C404	1-164-346-11	CERAMIC CHIP	1uF		16V
C406	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C407	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C408	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C409	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C412	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C413	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C414	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C415	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C416	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C417	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C418	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C420	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C421	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C422	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C423	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C424	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C425	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C426	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C427	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C428	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C429	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C430	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C431	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C432	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C433	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C434	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C435	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C437	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C438	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C439	1-162-907-11	CERAMIC CHIP	2PF	0.25PF	50V
C440	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C441	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C442	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C443	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C444	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C445	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C446	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C447	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C449	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C450	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C451	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C452	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C453	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C454	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C455	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C456	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C457	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C458	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C459	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C460	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C461	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C462	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C463	1-135-215-21	TANTALUM CHIP	6.8uF	20%	16V
C464	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C465	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C466	1-164-298-11	CERAMIC CHIP	0.15uF	10%	25V
C467	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C468	1-164-298-11	CERAMIC CHIP	0.15uF	10%	25V
C469	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C470	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C471	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C472	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V
C473	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C474	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C475	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C476	1-135-179-21	TANTALUM CHIP	2.2uF	20%	16V
C477	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C478	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C481	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C482	1-164-360-11	CERAMIC CHIP	0.1uF		16V

Ref. No.	Part No.	Description	Remark
C483	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C484	1-135-259-11	TANTALUM CHIP 10uF 20%	6.3V
C485	1-135-259-11	TANTALUM CHIP 10uF 20%	6.3V
C486	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C487	1-128-530-11	ELECT CHIP 33uF 20%	10V
		< FILTER >	
CF151	1-579-370-11	FILTER, CERAMIC	
		< CONNECTOR >	
CN002	1-569-775-21	PIN, CONNECTOR 5P	
CN101	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
CN102	1-580-789-21	PIN, CONNECTOR (SMD) 6P	
CN401	1-695-880-11	CONNECTOR, BOARD TO BOARD 32P	
CN403	1-573-338-11	CONNECTOR, BOARD TO BOARD 20P	
CN404	1-695-325-11	CONNECTOR, BOARD TO BOARD 42P	
CN406	1-573-343-21	CONNECTOR, BOARD TO BOARD 30P	
* CN407	1-580-055-21	PIN, CONNECTOR 2P	
		< DIODE >	
D001	8-719-800-76	DIODE 1SS226	
D152	8-719-027-48	DIODE MA142WA	
D159	8-719-027-50	DIODE MA142WK	
D160	8-719-027-50	DIODE MA142WK	
D163	8-719-027-50	DIODE MA142WK	
⚠D401	8-719-421-27	DIODE MA728	
D402	8-719-027-50	DIODE MA142WK	
D403	8-719-404-46	DIODE MA110	
		< FILTER >	
FL152	1-236-575-11	B.P.F	
FL153	1-236-146-11	FILTER, BAND PASS	
FL155	1-236-757-21	FILTER, LOW PASS (C)	
FL401	1-406-452-11	COIL, OSC	
		< IC >	
IC001	8-752-033-38	IC CXA1202R	
IC003	8-752-053-21	IC CXA1211M	
IC151	8-752-065-54	IC CXA1207AR	
IC152	8-752-051-40	IC CXA1208R	
IC154	8-752-332-68	IC CXL5502M	
IC155	8-752-053-21	IC CXA1211M	
IC156	8-759-067-52	IC MB88347PFV-G-BND-ER	
IC158	8-759-064-36	IC MB88346BPFV	
IC159	8-759-636-33	IC CXA1452N	
⚠IC401	8-759-056-84	IC S-8420AF	
IC402	8-752-836-29	IC CXP80624-416R	
IC403	8-759-096-79	IC uPD75316GF-318-3B9	
IC404	8-759-059-42	IC CXA1481AR-E2	
IC405	8-759-044-78	IC AK6420F	
IC406	8-759-081-96	IC uPD6456GS-620	

Ref. No.	Part No.	Description	Remark
IC407	8-759-145-63	IC uPD7564G-540	
IC408	8-759-057-60	IC MCD004BM	
IC409	8-759-999-02	IC TL1596CDB	
IC410	8-759-062-02	IC MPC1720VM	
		< COIL >	
L001	1-410-381-11	INDUCTOR CHIP 10uH	
L002	1-412-066-21	INDUCTOR CHIP 220uH	
L003	1-412-066-21	INDUCTOR CHIP 220uH	
L005	1-412-060-11	INDUCTOR CHIP 22uH	
L007	1-412-058-11	INDUCTOR CHIP 10uH	
L009	1-410-380-31	INDUCTOR CHIP 8.2uH	
L010	1-410-655-31	INDUCTOR CHIP 120uH	
L011	1-412-280-31	INDUCTOR 330uH	
L012	1-410-387-11	INDUCTOR CHIP 33uH	
L013	1-410-657-21	INDUCTOR CHIP 180uH	
L015	1-410-381-11	INDUCTOR CHIP 10uH	
L150	1-410-389-31	INDUCTOR CHIP 47uH	
L152	1-410-385-11	INDUCTOR CHIP 22uH	
L154	1-410-390-11	INDUCTOR CHIP 56uH	
L155	1-410-390-11	INDUCTOR CHIP 56uH	
L160	1-412-058-11	INDUCTOR CHIP 10uH	
L161	1-410-385-11	INDUCTOR CHIP 22uH	
L162	1-412-280-31	INDUCTOR 330uH	
L163	1-410-167-41	INDUCTOR CHIP 820uH	
L164	1-410-657-21	INDUCTOR CHIP 180uH	
L169	1-410-389-31	INDUCTOR CHIP 47uH	
L171	1-410-390-11	INDUCTOR CHIP 56uH	
L175	1-410-393-11	INDUCTOR CHIP 100uH	
L176	1-410-656-11	INDUCTOR CHIP 150uH	
L177	1-412-058-11	INDUCTOR CHIP 10uH	
L178	1-412-062-11	INDUCTOR CHIP 47uH	
L179	1-410-379-31	INDUCTOR CHIP 6.8uH	
L180	1-410-393-11	INDUCTOR CHIP 100uH	
L181	1-410-393-11	INDUCTOR CHIP 100uH	
L182	1-410-655-31	INDUCTOR CHIP 120uH	
L183	1-410-385-11	INDUCTOR CHIP 22uH	
L185	1-412-058-11	INDUCTOR CHIP 10uH	
L186	1-412-052-21	INDUCTOR CHIP 1uH	
L401	1-412-056-11	INDUCTOR CHIP 4.7uH	
L402	1-412-058-11	INDUCTOR CHIP 10uH	
L403	1-412-062-11	INDUCTOR CHIP 47uH	
L404	1-412-058-11	INDUCTOR CHIP 10uH	
L405	1-412-058-11	INDUCTOR CHIP 10uH	
L406	1-412-058-11	INDUCTOR CHIP 10uH	
L407	1-412-052-21	INDUCTOR CHIP 1uH	
		< IC LINK >	
⚠PS401	1-576-122-21	LINK, IC (CCP2E10 0.4A)	
⚠PS402	1-576-123-21	LINK, IC (CCP2E20 0.8A)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
Q001	8-729-216-22	TRANSISTOR 2SA1162-G	
Q002	8-729-014-16	TRANSISTOR RN2302-TE85L	
Q003	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q008	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q010	8-729-403-35	TRANSISTOR UN5113	
Q019	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q020	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q021	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q024	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q025	8-729-014-16	TRANSISTOR RN2302-TE85L	
Q026	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q029	8-729-403-35	TRANSISTOR UN5113	
Q151	8-729-101-07	TRANSISTOR 2SB798-DL	
Q152	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q154	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q158	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q161	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q162	8-729-403-35	TRANSISTOR UN5113	
Q166	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q168	8-729-403-35	TRANSISTOR UN5113	
Q170	8-729-420-20	TRANSISTOR XN4312	
Q171	8-729-117-73	TRANSISTOR 2SC4178-F14	
Q172	8-729-117-73	TRANSISTOR 2SC4178-F14	
Q175	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q176	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q177	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q178	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q180	8-729-422-54	TRANSISTOR XN4215	
Q182	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q183	8-729-420-53	TRANSISTOR UN5115	
Q184	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q189	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q192	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q194	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q195	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q196	8-729-403-35	TRANSISTOR UN5113	
Q199	8-729-807-87	TRANSISTOR 2SB1295-UL6	
Q200	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q203	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q204	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q205	8-729-402-42	TRANSISTOR UN5213	
Q207	8-729-403-35	TRANSISTOR UN5113	
Q208	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q210	8-729-402-42	TRANSISTOR UN5213	
Q221	8-729-420-12	TRANSISTOR XN4213	
Q231	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q232	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q233	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q234	8-729-402-55	TRANSISTOR 2SB1218A-R	

Ref. No.	Part No.	Description	Remark
Q236	8-729-420-56	TRANSISTOR UN511E	
Q237	8-729-402-55	TRANSISTOR 2SB1218A-R	
Q401	8-729-402-48	TRANSISTOR UN521E	
Q402	8-729-905-23	TRANSISTOR 2SA1576-R	
Q403	8-729-403-35	TRANSISTOR UN5113	
Q405	8-729-013-88	TRANSISTOR RN1302-TE85L	
Q409	8-729-017-67	TRANSISTOR 2SB1574	
		< RESISTOR >	
R001	1-216-806-11	METAL CHIP 56 5% 1/16W	
R002	1-216-818-11	METAL CHIP 560 5% 1/16W	
R003	1-216-803-11	METAL CHIP 33 5% 1/16W	
R004	1-216-814-11	METAL CHIP 270 5% 1/16W	
R005	1-216-813-11	METAL CHIP 220 5% 1/16W	
R006	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R007	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R012	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R013	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R016	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R017	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R020	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R021	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R022	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R023	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R024	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R025	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R026	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R027	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R028	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R030	1-216-864-11	METAL CHIP 0 5% 1/16W	
R031	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R033	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R049	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R050	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R051	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R052	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R054	1-216-817-11	METAL CHIP 470 5% 1/16W	
R055	1-216-820-11	METAL CHIP 820 5% 1/16W	
R056	1-216-864-11	METAL CHIP 0 5% 1/16W	
R057	1-216-818-11	METAL CHIP 560 5% 1/16W	
R058	1-216-818-11	METAL CHIP 560 5% 1/16W	
R060	1-216-864-11	METAL CHIP 0 5% 1/16W	
R061	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R062	1-216-818-11	METAL CHIP 560 5% 1/16W	
R063	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R064	1-216-817-11	METAL CHIP 470 5% 1/16W	
R066	1-216-809-11	METAL CHIP 100 5% 1/16W	
R067	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R070	1-216-834-11	METAL CHIP 12K 5% 1/16W	

Ref.No.	Part No.	Description				Remark
R071	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R072	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R076	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R078	1-216-820-11	METAL CHIP	820	5%	1/16W	
R079	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R081	1-216-864-11	METAL CHIP	0	5%	1/16W	
R082	1-216-864-11	METAL CHIP	0	5%	1/16W	
R083	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R085	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R086	1-216-817-11	METAL CHIP	470	5%	1/16W	
R087	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R088	1-216-808-11	METAL CHIP	82	5%	1/16W	
R090	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R097	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R112	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R113	1-216-295-00	METAL CHIP	0	5%	1/10W	
R114	1-216-864-11	METAL CHIP	0	5%	1/16W	
R131	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R132	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R142	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R151	1-216-296-00	METAL CHIP	0	5%	1/8W	
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R153	1-216-304-11	METAL CHIP	3.3	5%	1/10W	
R154	1-216-820-11	METAL CHIP	820	5%	1/16W	
R155	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R156	1-216-296-00	METAL CHIP	0	5%	1/8W	
R158	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R160	1-216-819-11	METAL CHIP	680	5%	1/16W	
R161	1-216-809-11	METAL CHIP	100	5%	1/16W	
R164	1-216-809-11	METAL CHIP	100	5%	1/16W	
R167	1-216-820-11	METAL CHIP	820	5%	1/16W	
R168	1-216-820-11	METAL CHIP	820	5%	1/16W	
R170	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R175	1-216-813-11	METAL CHIP	220	5%	1/16W	
R177	1-216-818-11	METAL CHIP	560	5%	1/16W	
R178	1-216-817-11	METAL CHIP	470	5%	1/16W	
R179	1-216-820-11	METAL CHIP	820	5%	1/16W	
R189	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R190	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R192	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R193	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R194	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R196	1-216-815-11	METAL CHIP	330	5%	1/16W	
R198	1-216-817-11	METAL CHIP	470	5%	1/16W	
R200	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R201	1-216-815-11	METAL CHIP	330	5%	1/16W	
R202	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R204	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R205	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R206	1-216-813-11	METAL CHIP	220	5%	1/16W	
R208	1-216-864-11	METAL CHIP	0	5%	1/16W	
R211	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R213	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R216	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R217	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R218	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R219	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R220	1-216-811-11	METAL CHIP	150	5%	1/16W	
R221	1-216-864-11	METAL CHIP	0	5%	1/16W	
R222	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R223	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R224	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R226	1-216-818-11	METAL CHIP	560	5%	1/16W	
R228	1-216-812-11	METAL CHIP	180	5%	1/16W	
R230	1-216-807-11	METAL CHIP	68	5%	1/16W	
R231	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R232	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R242	1-216-818-11	METAL CHIP	560	5%	1/16W	
R243	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R253	1-216-820-11	METAL CHIP	820	5%	1/16W	
R254	1-216-820-11	METAL CHIP	820	5%	1/16W	
R255	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R256	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R257	1-216-809-11	METAL CHIP	100	5%	1/16W	
R258	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R259	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R260	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R263	1-216-864-11	METAL CHIP	0	5%	1/16W	
R266	1-216-864-11	METAL CHIP	0	5%	1/16W	
R267	1-216-864-11	METAL CHIP	0	5%	1/16W	
R270	1-216-864-11	METAL CHIP	0	5%	1/16W	
R271	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R276	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R277	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R278	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R279	1-216-818-11	METAL CHIP	560	5%	1/16W	
R280	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R281	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R282	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R283	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R285	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R286	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R290	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R291	1-216-820-11	METAL CHIP	820	5%	1/16W	
R293	1-216-807-11	METAL CHIP	68	5%	1/16W	
R294	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R295	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R297	1-216-820-11	METAL CHIP	820	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R298	1-216-820-11	METAL CHIP	820	5%	1/16W	
R299	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R300	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R301	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R304	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R306	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R307	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R309	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R310	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R312	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R314	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R315	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R316	1-216-817-11	METAL CHIP	470	5%	1/16W	
R320	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R321	1-216-819-11	METAL CHIP	680	5%	1/16W	
R324	1-216-817-11	METAL CHIP	470	5%	1/16W	
R329	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R333	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R334	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R335	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R338	1-216-864-11	METAL CHIP	0	5%	1/16W	
R339	1-216-864-11	METAL CHIP	0	5%	1/16W	
R346	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R347	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R352	1-216-864-11	METAL CHIP	0	5%	1/16W	
R353	1-216-864-11	METAL CHIP	0	5%	1/16W	
R357	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R358	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R359	1-216-296-00	METAL CHIP	0	5%	1/8W	
R360	1-216-296-00	METAL CHIP	0	5%	1/8W	
R362	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R363	1-216-864-11	METAL CHIP	0	5%	1/16W	
R366	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R369	1-216-864-11	METAL CHIP	0	5%	1/16W	
R370	1-216-864-11	METAL CHIP	0	5%	1/16W	
R371	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R376	1-216-817-11	METAL CHIP	470	5%	1/16W	
R377	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R378	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R379	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R381	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R386	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R387	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R388	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R389	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R390	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R391	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R392	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R393	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R394	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R395	1-216-864-11	METAL CHIP	0	5%	1/16W	
R396	1-216-864-11	METAL CHIP	0	5%	1/16W	
R397	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R398	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R401	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R403	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R404	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R405	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R406	1-216-809-11	METAL CHIP	100	5%	1/16W	
R407	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R408	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R409	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R410	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R411	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R412	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R413	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R414	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R415	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R416	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R417	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R418	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R419	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R420	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R421	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R422	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R423	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R424	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R425	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R426	1-216-852-11	METAL CHIP	390K	5%	1/16W	
R427	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R428	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R429	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R430	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R431	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R432	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R433	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R435	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R436	1-216-864-11	METAL CHIP	0	5%	1/16W	
R437	1-216-817-11	METAL CHIP	470	5%	1/16W	
R438	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R439	1-216-864-11	METAL CHIP	0	5%	1/16W	
R441	1-216-864-11	METAL CHIP	0	5%	1/16W	
R442	1-216-864-11	METAL CHIP	0	5%	1/16W	
R443	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R445	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R447	1-216-864-11	METAL CHIP	0	5%	1/16W	
R448	1-216-809-11	METAL CHIP	100	5%	1/16W	
R449	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R450	1-216-833-11	METAL CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R451	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R452	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R453	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R454	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R456	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R457	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R460	1-216-864-11	METAL CHIP	0	5%	1/16W	
R461	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R462	1-216-809-11	METAL CHIP	100	5%	1/16W	
R463	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R468	1-216-039-00	METAL CHIP	390	5%	1/10W	
R469	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R470	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R471	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R472	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R473	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R474	1-217-671-11	METAL CHIP	1	5%	1/10W	
R475	1-217-671-11	METAL CHIP	1	5%	1/10W	
R476	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R479	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R480	1-217-671-11	METAL CHIP	1	5%	1/10W	
R481	1-217-671-11	METAL CHIP	1	5%	1/10W	
R484	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R485	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R487	1-216-864-11	METAL CHIP	0	5%	1/16W	
R488	1-216-809-11	METAL CHIP	100	5%	1/16W	
R489	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R490	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R491	1-216-296-00	METAL CHIP	0	5%	1/8W	
R492	1-216-864-11	METAL CHIP	0	5%	1/16W	
R493	1-216-864-11	METAL CHIP	0	5%	1/16W	
R497	1-216-864-11	METAL CHIP	0	5%	1/16W	
R498	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
		< NETWORK, RES >				
RB401	1-236-442-11	NETWORK, RES 330K				
RB402	1-236-907-11	NETWORK, RES 100K				
RB403	1-236-907-11	NETWORK, RES 100K				
RB404	1-236-908-11	NETWORK, RES 10K				
RB405	1-236-436-11	NETWORK, RES 100K				
RB406	1-236-908-11	NETWORK, RES 10K				
RB407	1-236-907-11	NETWORK, RES 100K				
RB408	1-236-908-11	NETWORK, RES 10K				
RB409	1-236-904-11	NETWORK, RES 1K				
RB410	1-236-412-11	NETWORK, RES 1.0K				
RB411	1-236-424-11	NETWORK, RES 10K				
RB414	1-236-904-11	NETWORK, RES 1K				
RB416	1-236-412-11	NETWORK, RES 1.0K				
RB417	1-236-444-11	NETWORK, RES 470K				
RB418	1-236-408-11	NETWORK, RES 470				

Ref. No.	Part No.	Description				Remark
RB419	1-236-412-11	NETWORK, RES 1.0K				
RB420	1-236-904-11	NETWORK, RES 1K				
RB421	1-236-908-11	NETWORK, RES 10K				
RB422	1-236-424-11	NETWORK, RES 10K				
RB423	1-236-424-11	NETWORK, RES 10K				
RB424	1-236-424-11	NETWORK, RES 10K				
RB425	1-236-424-11	NETWORK, RES 10K				
RB426	1-236-412-11	NETWORK, RES 1.0K				
		< VARIABLE RESISTOR >				
RV151	1-238-087-11	RES, ADJ, CERMET	1K			
		< FLEXIBLE BOARD >				
W001	1-696-489-11	FP-588 FLEXIBLE BOARD				
W405	1-644-285-11	FP-572 FLEXIBLE BOARD				
		< VIBRATOR >				
X151	1-579-365-21	VIBRATOR, CRYSTAL (3.58MHz)				
X401	1-579-063-21	VIBRATOR, CERAMIC (4.19MHz)				
X402	1-579-049-21	VIBRATOR, CRYSTAL (32.768kHz)				
X403	1-579-367-21	VIBRATOR, CRYSTAL (11.89MHz)				
X404	1-579-551-11	VIBRATOR, CERAMIC (700kHz)				

****

* A-7071-830-A WS-11 BOARD, COMPLETE

****

(Ref. No. 2,000 Series)

Ref. No.	Part No.	Description				Remark
		< CONNECTOR >				
* CN681	1-580-055-21	PIN, CONNECTOR 2P				
CN682	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P				
		< RESISTOR >				
R681	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R683	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R684	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R685	1-216-081-00	METAL CHIP	22K	5%	1/10W	
		< SWITCH >				
S681	1-572-272-11	SWITCH, SLIDE (WIDE ANGLE)				

****

MISCELLANEOUS

****

Ref. No.	Part No.	Description	Remark
14	1-696-487-11	CABLE, FLAT (FFC-90)	
18	A-7091-800-A	MICROPHONE UNIT	
80	1-692-257-31	SWITCH, PUSH (ZOOM)	
106	1-547-558-21	FILTER BLOCK, OPTICAL	
108	1-547-548-11	LENS, ZOOM (VCL-6210WC)	

Ref. No.	Part No.	Description	Remark
264	1-568-323-11	CONNECTOR (4P)	
322	1-641-643-12	FP-444 FLEXIBLE BOARD	
324	1-691-254-13	CONNECTOR, TRANSLATION 10P	
⚠F901	1-532-778-21	FUSE, MICRO (SECONDARY)	
⚠F902	1-532-778-21	FUSE, MICRO (SECONDARY)	
H516	1-550-104-32	HOLDER, BATTERY	
IC875	A-7030-368-A	CCD BLOCK ASSY (AUTO) (CCD IMAGER)	
J901	1-537-281-41	TERMINAL BOARD	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
M904	3-708-494-01	METER ASSY, IG (IRIS)	
M905	3-708-491-01	MOTOR ASSY, STEPPING (FOCUS)	
M906	3-708-492-01	MOTOR ASSY, PZ (ZOOM)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	
S005	1-570-771-21	SWITCH (C DOWN)	
⚠V901	1-452-565-11	CRT ASSY (M01KKD70WB)	
W001	1-696-489-11	FP-588 FLEXIBLE BOARD	
W405	1-644-285-11	FP-572 FLEXIBLE BOARD	
⚠W501	1-540-019-21	SOCKET ASSY, CRT	
W517	1-751-165-11	CABLE, FLAT (FFC-100)	
W519	1-696-488-11	CABLE, FLAT (FFC-92)	
W521	1-642-186-11	FP-437 FLEXIBLE BOARD	
W522	1-696-490-11	FP-589 FLEXIBLE BOARD	
W971	1-696-484-11	CABLE, FLAT (FFC-87)	
W986	1-696-621-11	FP-590 FLEXIBLE BOARD	
W987	1-696-622-11	FP-591 FLEXIBLE BOARD	
W991	1-696-483-11	CABLE, FLAT (FFC-86)	

****

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remark
	1-465-927-71	REMOTE COMMANDER (CAM CORDER) (RMT-507)	
	1-575-334-11	CORD, CONNECTION (A/V connecting cable)	
	3-738-517-01	BELT (S), SHOULDER	
	3-756-693-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (TR323)	
	3-756-693-41	MANUAL, INSTRUCTION (CHINESE) (TR323)	
	3-756-694-21	MANUAL, INSTRUCTION (ENGLISH) (TR61)	
	3-756-694-31	MANUAL, INSTRUCTION (FRENCH) (TR61:CND)	
*	3-795-581-21	SAFEGUARD (SONY), IMPORTANT (TR61:US)	
	3-943-154-11	HOLDER (B), REMOTE CONTROL	
*	3-949-006-81	INDIVIDUAL CORTON (TR61)	
*	3-949-006-91	INDIVIDUAL CORTON (TR323)	
*	3-953-701-01	CUSHION, ACC	
*	3-953-702-01	CUSHION (LOWER)	
	A-6768-253-A	RFU ADAPTOR (RFU-90UC)	

Ref. No.	Part No.	Description	Remark
**	AC-V25	AC POWER ADAPTOR	
***	NP-55	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE

*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY

****

****
HARDWARE LIST
****

Ref. No.	Part No.	Description	Remark
#1	7-627-853-57	PRECISION SCREW +P2X5	

Be sure to read "Precautions for Replacement of CCD Imager" on page 87 when changing the CCD imager.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

SECTION 7
CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 208.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)[Note 1]	J-6082-053-B	
J-6	Extension cord (10P, 1 mm)	J-6082-064-A	For extension of JK-99 board
J-7	Extension cord (20P, 0.8 mm)	J-6082-196-A	For extension of CN-73 board (Cabinet (R)) (For the video and the camera section adjustment)
J-8	Extension cord (16P, 0.8 mm)	J-6082-136-A	For the extension of the lens block (During the repair of the camera section)
J-9	Relay board (21P, 0.5 mm)[Note 2]	J-6082-176-A	For the extension of the lens block (During the repair of the camera section)
J-10	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-11	Extension cord (42P, 0.8 mm)	J-6082-195-A	For the extension of DD-56 board (During the repair of the video section)
J-12	Siemens star	J-6080-875-A	For flange back check
J-13	Extension cord (20P, 0.5 mm)[Note 2]	J-6082-138-A	For extension between the lens block (FPC) and VC-133 board (CN851) (During the repair of the camera section)
J-14	Extension board (30P, 0.8 mm)	J-6082-167-A	For the extension of VS-100 board (For the mecha deck check)
J-15	Extension cord (32P, 0.8 mm)	J-6082-249-A	For extension of AU-150 board (During the repair of AU-150 board)

Note 1: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

Note 2: The extension code (J-6082-138-A) is also attached with a 21P, 0.5 mm code. Connect this code to the relay board (J-6082-176-A) for extensions between the lens block (FPC) and VC-133 board (CN851).

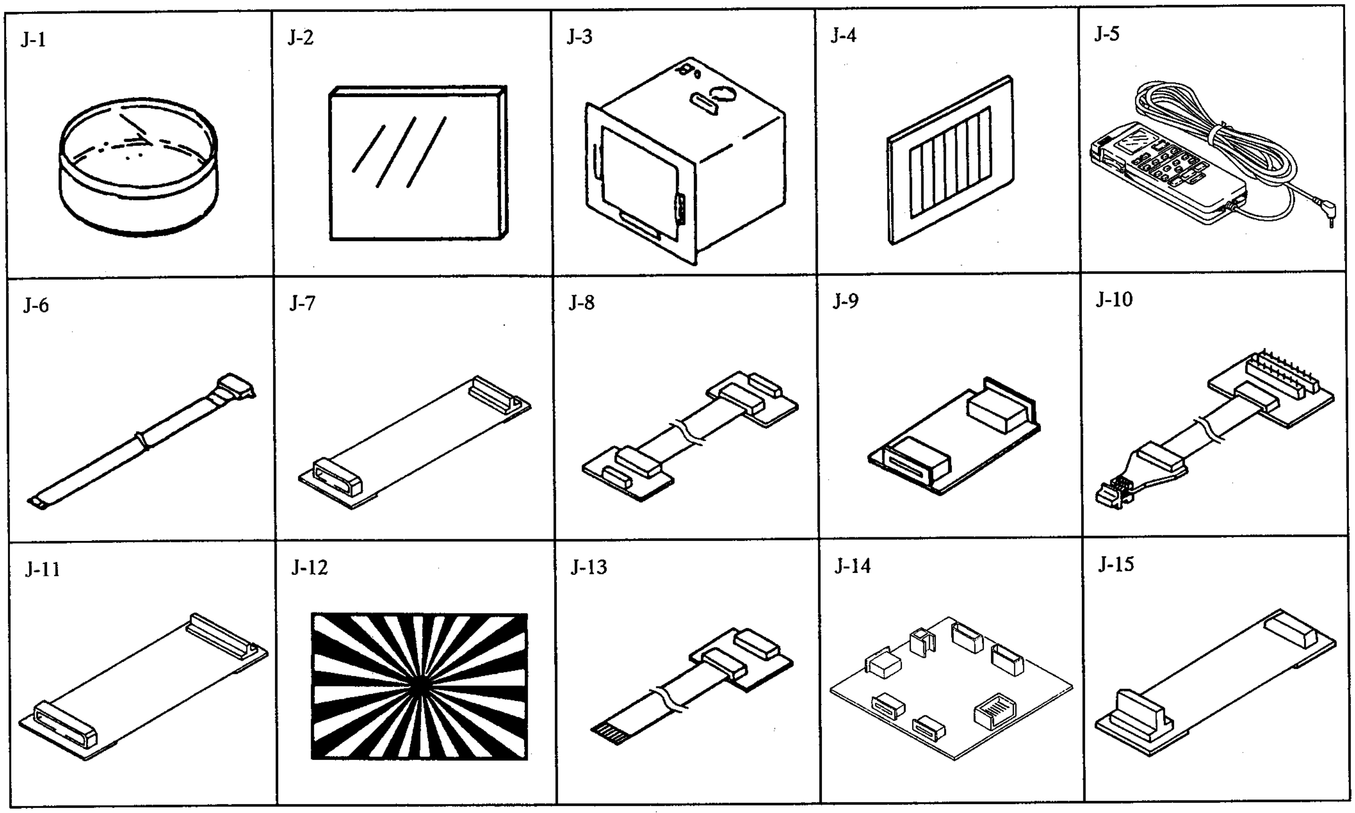

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11
J-12
J-13
J-14
J-15

Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to "2. Disassembly".

1) Connect the equipments for adjustment as shown in Fig. 7-3.
2) The EVF (Electronic viewfinder) is required for checking the white balance mode and shutter speeds. If the EVF is not required, remove the VS-100 board CN102.

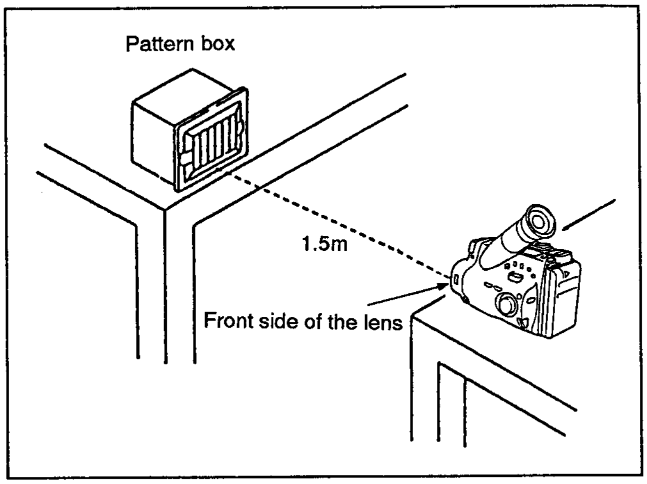

Pattern box
1.5m
Front side of the lens

Fig. 7-2.

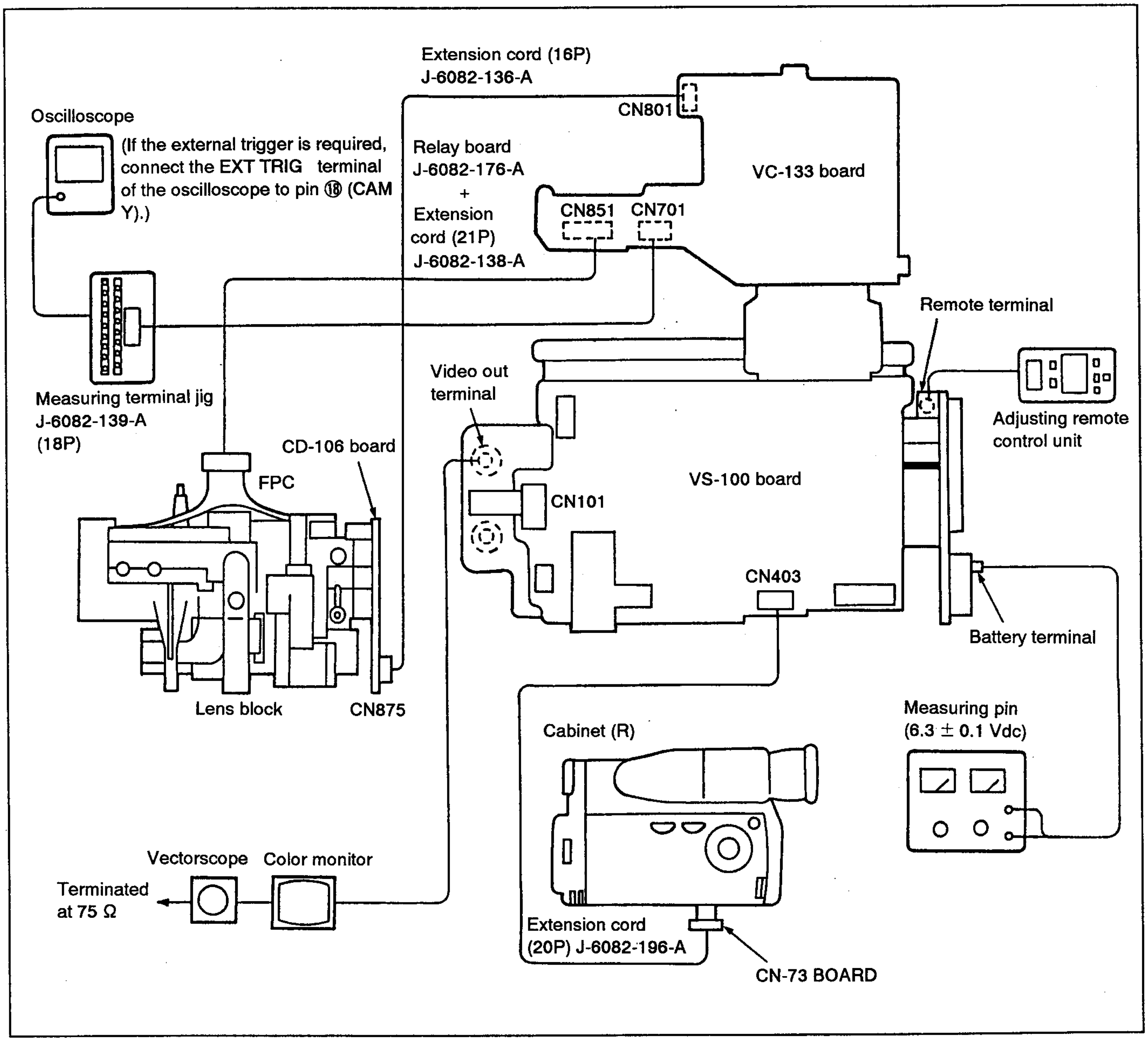

Extension cord (16P)
J-6082-136-A
Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to pin ⑱ (CAM Y).)
CN801
Relay board
J-6082-176-A
+
Extension
cord (21P)
J-6082-138-A
VC-133 board
CN851
CN701
Remote terminal
Measuring terminal jig
J-6082-139-A
(18P)
Video out
terminal
Adjusting remote
control unit
CD-106 board
FPC
VS-100 board
CN101
CN403
Battery terminal
Lens block
CN875
Measuring pin
(6.3 ± 0.1 Vdc)
Cabinet (R)
Vectorscope
Color monitor
Terminated
at 75 Ω
Extension cord
(20P) J-6082-196-A
CN-73 BOARD

Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/player power switch (VK-32 board S977)····Camera
2. Standby switch (SW-223 board S519)·················Standby
3. LENS OPEN switch (MF-214 board S973) ·············OPEN
4. FOCUS button (MF-214 board S971) ···············MANUAL
5. PROGRAM AE selector (CF-34 board S997) ·····NORMAL
6. WIDE ANGLE switch (WS-11 board S681)·············· OFF

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart.
   (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

Color bar chart standard picture frame

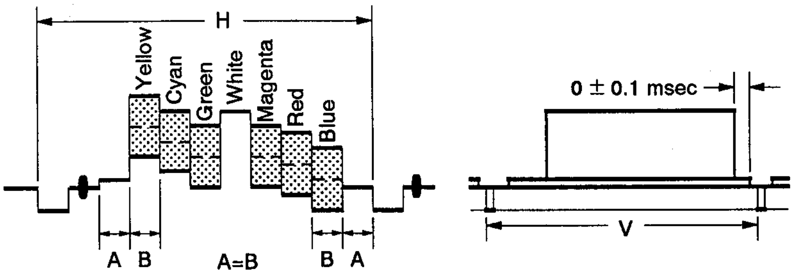

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
0 ± 0.1 msec
V
A
B
A=B
B
A

Fig. a (Video input/output terminal output waveform)

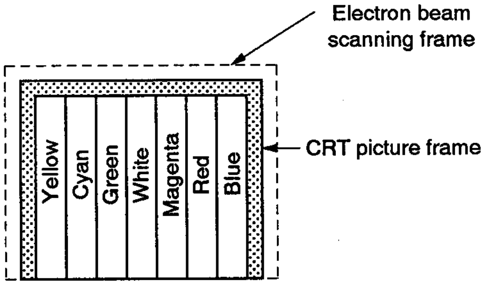

Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

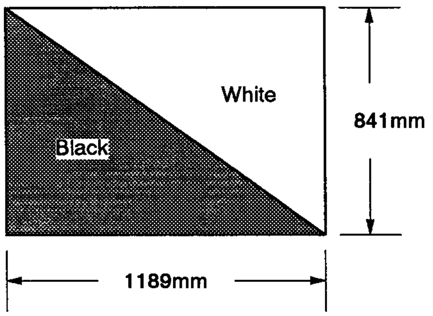

White
Black
841mm
1189mm

Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (VC-133 board IC702). These processes are carried out by the camera micro processor (VC-133 board IC709). This micro processor reads the data written in the non-volatile memory (VC-133 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

1) Connect the adjusting remote control unit to the remote terminal (DD-56 board J902).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

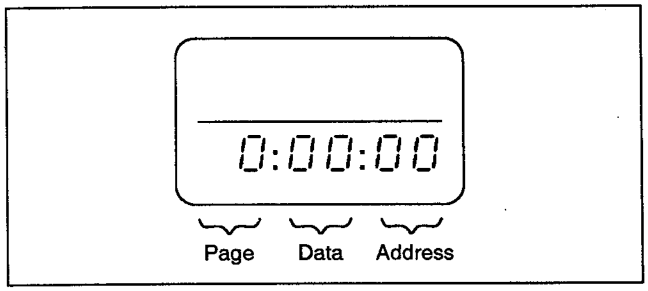


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (▸▸) button is pressed, and decrease when the REW (◂◂) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>00</td><td>ID</td><td>Set ID</td><td>3D</td><td>3D</td></tr>
<tr><td>01</td><td>FADER LEVEL</td><td>AE REF level modification during fader</td><td>E0</td><td>E0</td></tr>
<tr><td>02</td><td>FADER ENDTIM</td><td>The setting of the AE REF modulation time during fader</td><td>10</td><td>10</td></tr>
<tr><td>03</td><td>CS SL</td><td>Carrier balance adjustment</td><td>35</td><td></td></tr>
<tr><td>04</td><td>VSUB</td><td>CCD imager V SUB adjustment [IC702 ③]</td><td>80</td><td></td></tr>
<tr><td>05</td><td>VPGH</td><td>CCD imager VRG adjustment [IC702 ④]</td><td>80</td><td></td></tr>
<tr><td>06</td><td>VREF Y</td><td>Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]</td><td>7B</td><td></td></tr>
<tr><td>07</td><td>VREF C</td><td>Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]</td><td>99</td><td></td></tr>
<tr><td>08</td><td>HALL GAIN</td><td>Hole amplifier gain adjustment [IC702 ⑦] } HALL adjustment</td><td>47</td><td></td></tr>
<tr><td>09</td><td>HALL OFFSET</td><td>Hole amplifier offset adjustment [IC702 ⑧]</td><td>71</td><td></td></tr>
<tr><td>0A</td><td>LOWLIGHT CS</td><td>Point at which the low illuminance color starts disappearing.</td><td>C0</td><td>C0</td></tr>
<tr><td>0B</td><td>REF 2V</td><td>2V standard voltage for hole element [IC702 ⑫]</td><td>68</td><td>68</td></tr>
<tr><td>0C</td><td>AD REF</td><td>Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]</td><td>72</td><td></td></tr>
<tr><td>0D</td><td>CORE DETH</td><td>CCD correction control</td><td>04</td><td>04</td></tr>
<tr><td>0E</td><td>CORE VTR DELAY</td><td>1HDL longitudinal setting during VTR playback</td><td>16</td><td>16</td></tr>
<tr><td>0F</td><td>CORE APCN4</td><td>Horizontal aperture setting</td><td>35</td><td>35</td></tr>
<tr><td>10</td><td>CORE APCN5</td><td>Vertical aperture setting</td><td>3D</td><td>3D</td></tr>
<tr><td>11</td><td>CORE EFECT</td><td>Special effect control</td><td>A8</td><td>A8</td></tr>
<tr><td>12</td><td>CORE MATR</td><td>RED matrix constant</td><td>27</td><td>27</td></tr>
<tr><td>13</td><td>CORE MATB</td><td>BLUE matrix constant</td><td>6C</td><td>6C</td></tr>
<tr><td>14</td><td>CORE BURST LEVEL</td><td>Burst flag level setting, color modulation ON/OFF<table><tr><th>Data</th><th>Adjustment modeAdjustment</th></tr><tr><td>2C</td><td>Normal level</td></tr><tr><td>2E</td><td>Color modulation stopped</td></tr></table></td><td>2C</td><td>2C</td></tr>
<tr><td>15</td><td>CORE CHROMA DLY</td><td>Y/C delay adjustment</td><td>07</td><td>07</td></tr>
<tr><td>16</td><td>CORE Y SETUP</td><td>Set up level setting</td><td>06</td><td>06</td></tr>
<tr><td>17</td><td>CORE VHAPCN</td><td>Slice and level setting of the aperture signal</td><td>18</td><td>18</td></tr>
<tr><td>18</td><td>CORE B-Y GAIN</td><td>B–Y GAIN } Color reproduction adjustments</td><td>13</td><td></td></tr>
<tr><td>19</td><td>CORE R-Y GAIN</td><td>R–Y GAIN</td><td>11</td><td></td></tr>
<tr><td>1A</td><td>CORE R-Y HUE</td><td>R–Y HUE</td><td>FF</td><td></td></tr>
<tr><td>1B</td><td>CORE B-Y HUE</td><td>B–Y HUE</td><td>FD</td><td></td></tr>
<tr><td>1C</td><td>CS/APCCUT</td><td>Low luminance intensity aperture and chroma suppress level</td><td>22</td><td>22</td></tr>
</table>

Table 7-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal		Adjustment data	
				Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18

Table 7-2 (2).

*1: ( ) contains data for when IC707 of the VC-133 board is CXD2100Q.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>47</td><td>AWB KEIKO R</td><td>AWB incoming or output frame fluorescent light R coefficient</td><td>66</td><td>66</td></tr>
<tr><td>48</td><td>AWB KEIKO B</td><td>AWB incoming or output frame fluorescent light B coefficient</td><td>18</td><td>18</td></tr>
<tr><td>49</td><td>AWB BOTTOM UP</td><td>AWB incoming frame bottom upper value</td><td>C2</td><td>C2</td></tr>
<tr><td>4A</td><td>AWB BOTTOM DWN</td><td>AWB incoming frame bottom lower value</td><td>8C</td><td>8C</td></tr>
<tr><td>4B</td><td>AWB MIDDLE UP</td><td>AWB incoming frame middle upper value</td><td>AD</td><td>AD</td></tr>
<tr><td>4C</td><td>AWB MIDDLE DWN</td><td>AWB incoming frame middle lower value</td><td>96</td><td>96</td></tr>
<tr><td>4D</td><td>AWB TOP UP</td><td>AWB incoming frame top upper value</td><td>78</td><td>78</td></tr>
<tr><td>4E</td><td>AWB TOP DWN</td><td>AWB incoming frame top lower value</td><td>60</td><td>60</td></tr>
<tr><td>4F</td><td>AWB KEIKO</td><td>AWB output frame fluorescent light lower value</td><td>66</td><td>66</td></tr>
<tr><td>50</td><td>AWB KEIKO DWN</td><td>AWB incoming frame fluorescent light lower value</td><td>59</td><td>59</td></tr>
<tr><td>51</td><td>AWB R TOP LMT</td><td>AWB incoming frame Rcont upper value</td><td>6E</td><td>6E</td></tr>
<tr><td>52</td><td>AWB R DWN LMT</td><td>AWB incoming frame Rcont lower value</td><td>20</td><td>20</td></tr>
<tr><td>53</td><td>AWB B TOP LMT</td><td>AWB incoming frame Bcont upper value</td><td>83</td><td>83</td></tr>
<tr><td>54</td><td>AWB B IN TOP</td><td>AWB indoor incoming frame Bcont upper value</td><td>67</td><td>67</td></tr>
<tr><td>55</td><td>AWB B IN MAX</td><td>AWB indoor output frame Bcont upper value</td><td>5C</td><td>5C</td></tr>
<tr><td>56</td><td>AWB B OUT MIN</td><td>AWB outdoor output frame Bcont lower value</td><td>5C</td><td>5C</td></tr>
<tr><td>57</td><td>AWB B OUT DWN</td><td>AWB outdoor incoming frame Bcont lower value</td><td>4A</td><td>4A</td></tr>
<tr><td>58</td><td>AWB B DWN LMT</td><td>AWB incoming frame Bcont lower value</td><td>1B</td><td>1B</td></tr>
<tr><td>59</td><td>AWB LL LMT</td><td>Low luminance intensity limiter</td><td>06</td><td>06</td></tr>
<tr><td>5A</td><td>AWB T M DIVID</td><td>AWB incoming frame upper, middle border value</td><td>5E</td><td>5E</td></tr>
<tr><td>5B</td><td>AWB B M DIVID</td><td>AWB incoming frame middle, lower border value</td><td>39</td><td>39</td></tr>
<tr><td>5C</td><td>AWB DELAY TM</td><td>AWB tracking speed<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>01</td><td>High speed tracking mode</td></tr><tr><td>10</td><td>Normal</td></tr></table></td><td>10</td><td>10</td></tr>
<tr><td>5D</td><td>AWB FAST TM</td><td>AWB initial high speed tracking amount</td><td>40</td><td>40</td></tr>
<tr><td>5E</td><td>AWB OUT HYS OFF</td><td>AWB outdoor hysteresis off difference</td><td>0C</td><td>0C</td></tr>
<tr><td>5F</td><td>AWB OUT B HYS</td><td>AWB outdoor hysteresis amount</td><td>06</td><td>06</td></tr>
<tr><td>60</td><td>AWB MODE</td><td>AWB adjustment mode<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>00</td><td>Normal</td></tr><tr><td>D0</td><td>AWB adjustment mode</td></tr><tr><td>F1</td><td>All area tracking mode</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>61</td><td>AE REFL</td><td>Reference value (lower) for AE</td><td>00</td><td>00</td></tr>
<tr><td>62</td><td>AE REFH</td><td>Reference value (upper) for AE</td><td>1E (18)</td><td>1E (18)</td></tr>
<tr><td>63</td><td>AGC MIN</td><td>AGC MIN value (AGCREF value), IRIS level adjustment</td><td>E3</td><td></td></tr>
<tr><td>64</td><td>AE MIML</td><td>Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment</td><td>32</td><td></td></tr>
<tr><td>65</td><td>AE MAXL</td><td>High luminance intensity side limiter (lower)</td><td>80</td><td>80</td></tr>
<tr><td>66</td><td>IRIS OFFSET</td><td>Iris ROM table OPEN side offset</td><td>D0</td><td>D0</td></tr>
<tr><td>67</td><td>AE KEISU</td><td>Correction coefficient during detection weighting</td><td>00</td><td>00</td></tr>
<tr><td>68</td><td>AE FUNCTION</td><td>SW for turning each AE function ON and OFF</td><td>00</td><td>00</td></tr>
</table>

Table 7-2 (3).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
69	BL HOSEIH	Forcible back light level setting (upper)	40	40
6A	JITEISU DOWN	Constant during loop response DOWN side	30	30
6B	JITEISU UP	Constant during loop response UP side	10	10
6C	AE KNEE	KNEE setting value for AE	FF	FF
6D	ORETEN SET	Variable point due to time constant error amount	13	13
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYAKOU JITEISU	Constant during auto back light response	08	08
76	SABUN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	A0	A0
78	FUZZY RULE2	Correction amount 2 for auto back light	D0	D0
79	FUZZY RULE3	Correction amount 3 for auto back light	E0	E0
7A	FUZZY RULE4	Correction amount 4 for auto back light	B0	B0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	90	90
7D	FUZZY RULE7	Correction amount 7 for auto back light	B0	B0
7E	FUZZY RULE8	Correction amount 8 for auto back light	B8	B8
7F	FUZZY RULE9	Correction amount 9 for auto back light	98	98
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value for small iris (lower)	42	42
82	IRIS MIN H	Iris limit value for small iris (upper)	02	02
83	DELTA SHUT GAIN	Shutter smoothing value setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower) Flange back adjustment	DE	
87	WIDE LIMITH	ZOOM limiter WIDE (upper)	02	
88	TELE LIMIT	ZOOM limiter TELE (lower)	22	
89	TELE LIMITH	ZOOM limiter TELE (upper)	1D	
8A	STEP ZERO	Flange back value	90	
8B	STEP ZERO SPAN	Frange back value 2	A0	
8C	ZOOM SPD FAST	Zoom speed (fast)	60	60
8D	ZOOM SPD SUPER	Zoom speed (For adjustment)	59	59
8E	ZS INIT SLOW	Zoom speed initial value (slow)	59	59
8F	ZS INIT FAST	Zoom speed initial value (fast)	59	59
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	11	11
92	ZS L	Zoom servo coefficient L	04	04

Table 7-2 (4).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>93</td><td>ZP HYS</td><td>Zoom potential hysteresis</td><td>03</td><td>03</td></tr>
<tr><td>94</td><td>ZOOM SPD SLOW</td><td>Zoom speed (slow)</td><td>22</td><td>22</td></tr>
<tr><td>95</td><td>AF MD2THL</td><td>MODE2 THR</td><td>20</td><td>20</td></tr>
<tr><td>96</td><td>MAXCHG THR</td><td>MAX value renewal THR</td><td>1A</td><td>1A</td></tr>
<tr><td>97</td><td>ERR THRL</td><td>Wobbling width THR</td><td>18</td><td>18</td></tr>
<tr><td>98</td><td>WOB INTV</td><td>Wobbling second interval</td><td>04</td><td>04</td></tr>
<tr><td>99</td><td>ERRPOL THR</td><td>MODE2 error possible THR</td><td>13</td><td>13</td></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>8B</td><td>8B</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>C6</td><td>C6</td></tr>
<tr><td>9F</td><td>ZOOM RIZE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>FB CURVEPEAKL</td><td>Constant for flange back adjustment</td><td>F5</td><td>F5</td></tr>
<tr><td>A1</td><td>FB CURVEPEAKH</td><td>Constant for flange back adjustment</td><td>0B</td><td>0B</td></tr>
<tr><td>A2</td><td>FB ZOOMSL</td><td>Constant for flange back adjustment</td><td>02</td><td>02</td></tr>
<tr><td>A3</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>07</td><td>07</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>14</td><td>14</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>17</td><td>17</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>FF</td><td>FF</td></tr>
<tr><td>A7</td><td>FB ZOOM SLOW</td><td>Constant for flange back adjustment</td><td>1C</td><td>1C</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>02</td><td>02</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>08</td><td>Zoom, Focus fixed</td></tr>
<tr><td>00</td><td>Normal</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MODE</td><td>Flange back adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Nomal</td></tr>
<tr><td>01</td><td>Flange back adjustment</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>LENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF DELAY</td><td>bit=0: NTSC, 1: PAL, bit3=0: 510h, 1: 760h,
bit4-7=CCD correction delay</td><td>20</td><td>20</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover
<table>
<tr><th>Data</th><th>DDS display mode</th></tr>
<tr><td>00</td><td>Y sampling display</td></tr>
<tr><td>02</td><td>R−Y display</td></tr>
<tr><td>40</td><td>HALL data display</td></tr>
<tr><td>82</td><td>R ratio display</td></tr>
<tr><td>83</td><td>B ratio display</td></tr>
<tr><td>91</td><td>R, B ratio (M) display</td></tr>
<tr><td>B0</td><td>Focus step display</td></tr>
</table></td><td>00</td><td>00</td></tr>
</table>

Table 7-2 (5).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
B0	CORE OTHER	CORE MODE DATA 13 byte	12	12
B1	CORE Y GAIN	CORE FIELD DATA 0 byte	3F	3F
B2	E LOW LIGHT START	Low light chroma suppress start point	30	30
B3				
B4	YAKEI LEVEL	YAKEI mode gain setting value	40	40
B5	IRIS ROM TABLE SW	Iris ROM table switchover	00	00
B6	ZOOM DROP 1	F-No. dropping (1) by Zoom lens	60	60
B7	ZOOM DROP 2	F-No. dropping (2) by Zoom lens	75	75
B8				
B9				
BA	AWB IN B HYS	Hysteresis amount of AWB indoor BLUE	04	04
BB	AWB IN R HYS	Hysteresis amount of AWB indoor RED	02	02
BC	AWB KAKE NORM R	ADD: 35 NORM R × 1000H	20	20
BD	AWB KAKE NORM B	ADD: 36 NORM B × 1000H	20	20
BE	MF STEP CHNGE	Coefficent of MODE 2 THR	46	46
BF	MD2 LOWCON SPD	Speed for Low-contrast at MODE 2	07	07
C0	MAX CHECK NG CNT	MAX CHECK NG count	1E	1E
C1	AF CONTROL FLAG		0E	0E
C2	AE Y THR	Low light AE fluctuation THR 1	28	28
C3	AE Y MIN	Low light AE fluctuation THR 2	20	20
C4	MD2 SPD	Focus speed at MODE 2	61	61
C5	AE CHECK	Re-start up AE THR	10	10
C6	LOW CON THR	THR 1 for judging Low-contrast at MODE 2	10	10
C7	LOW CON THR2	THR 2 for judging Low-contrast at MODE 2	20	20
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (1) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01 10 11	Camera adjustment mode (1), F page write protect released Normal Camera adjustment mode (2), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00 01 03 05 07 09 0B 0D 0F 11 13 15 17 1D	Normal IRIS OPEN, AGC HOLD IRIS CLOSE1, AGC HOLD IRIS CLOSE2, AGC MIN IRIS CLOSE3, AGC MAX ND0.5 SHUTTER (PAL=1/160, NTSC=1/190) ND0.8 SHUTTER (PAL=1/320, NTSC=1/380) AWB PRESET1: 3200K PRESET DATA take in WB 3200K PRESET: Indoor white balance mode AWB PRESET2: Preparation of 3200K PRESET DATA take in ZOOM HUNTING1 ZOOM SPDSLOW ZOOM HUNTING2 ZOOM SPDFAST AE FB adjustment mode (IRIS: OPEN, AGC: REF, SHUTTER: 1/100 (NTSC), 1/120 (PAL)) EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00 19	NTSC=1/60, PAL=1/50 1/2000
06	FOCUS limiter ON/OFF	00 01	FOCUS limiter ON (Normal) FOCUS limiter OFF
07	ZOOM limiter ON/OFF	00 01	ZOOM limiter ON (Normal) ZOOM limiter OFF
08	ZOOM speed SLOW/FAST	00 01 02 03	Normal ZOOM speed SLOW ZOOM speed FAST ZOOM speed SUPER SLOW
09 ★	COMPLEATED FLAG	00 01	Camera Adjustment not completed Camera adjustment completed
11 ★	ROM VERSION	03	Camera micro processor ver3 (CXP80624-434R)
0C ★	LENS INITIAL END	00 01	During the initial operation of the lens Lens initial operation completed

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the VC-133 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	D5V	2	NC
3	NC	4	CAM SI
5	NC	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	CAM C
15	PG CONT	16	GND
17	NC	18	CAM Y

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

②↓ (column D)

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (DD-56 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑤ and ⑧ of CN901
Specified value	4.92 ± 0.15 Vdc
D4V check	
Measurement point	Pin ④ of CN901
Specified value	3.98 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑦ and ⑩ of CN901
Specified value	$4.86^{+0.15}_{-0.11}$ Vdc
CAM 15V check	
Measurement point	Pin ⑫ of CN901
Specified value	15.05 ± 0.4 Vdc
CAM –9V check	
Measurement point	Pin ⑨ of CN901
Specified value	–8.5 ± 0.4 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Check that the data of page: 6, address: 09 is 00.
(Display indicating that page F data can be initialized)
2) Check that the data of page: 6, address: 01 is 00.
3) Set data: 1D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Page F data initialization execution.
The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
(Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
(Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

Address	Data
00 (ID)	3D
62 (AE REFH)*1	18
A2 (FB ZOOM SL)	02
A3 (FB ZOOM SH)	07
B2 (E LOW LIGHT START)	30

*1: Change the data only if IC707 of the VC-133 board is CXD2100Q.

[Distinguishing the Camera Micro Processor (IC709) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.3	CXP80624-434R	03

4. 28 MHz Original Oscillation Adjustment (VC-133 board)

Subject	Not required
Measurement Point	Pin ⑰ of IC706 (14 MHz)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14318181 ± 71 Hz

Adjusting method:

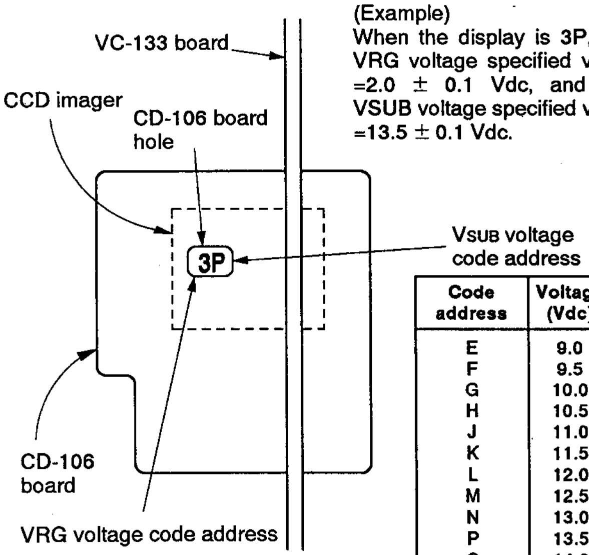
1) Use CT801 to adjust the oscillation frequency to 14318181 ± 71 Hz.

5. V SUB Adjustment (VC-133 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.



(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.

VSUB voltage code address

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

Fig. 7-7.

6. VRG Adjustment (VC-133 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of VC-133 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit before changing addresses.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of VC-133 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 to 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).
    $A'=W_2'+K_1'-W_1'-K_2'$ ··························Equation 1
    $B'=W_1'-K_1'$ ···Equation 2
    $X_1'=\frac{2048+(48\times A')-(16\times B')}{A'}$ ················Equation 3
14) Convert X_1' to hexadecimal notation, and obtain X_1.
    (Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
20) Convert W_0 to hexadecimal notation, and obtain W_0'.
21) Calculate X_2' using the following equations (decimal notation calculation).
    $C'=W_0'-B'-51$ ···································Equation 4
    $X_2'=\frac{(128-B')\times(X_1'-48)+48\times C'}{C'}$ ···········Equation 5
    (X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
    (Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1998 ± 5mm from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H), 8A (STEP ZERO), 8B (STEP ZERO SPAN)

Adjusting method:
1) Turn the auto focus off.
2) Adjust the focus using the focus knob.
3) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
4) Release the protect.
   Page: 6, address: 00, data: 01
5) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
6) Check that the page: F, address: 86 to 8B data is at the initial value. (Refer to Table 7-2. "Page F address list")
7) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8B.)
8) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments
1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (2m (or 1.4m) from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	D2=D1 ± 5

Checking method:
1) Set data: 01 to page: 6, address: 00. (Camera adjustment mode)
2) Set data: B0 to page: F, address: AF. (Focus step display mode)
3) Place the Siemens star 2m (or 1.4m) from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image displayed on the monitor TV screen.
5) Turn off the auto-focus.
6) Shoot the Siemens star with the zoom TELE end.
7) Rotate the focus ring, and adjust the focus.
8) Adjust to the zoom WIDE end.
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D1.
10) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and take the value as D2.
11) Check that D2=D1 ± 5.

Process after checking
1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

11. SYNC Level Adjustment (VC-133 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=140 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

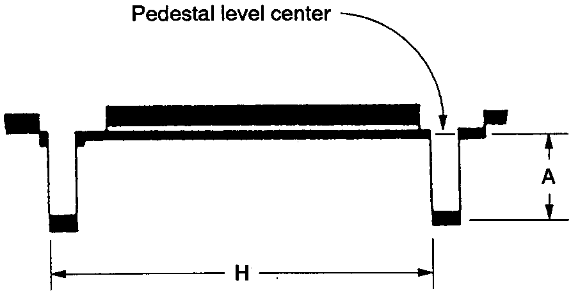


Fig. 7-8.

12. BURST Level Adjustment (VC-133 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (CAM C)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=140 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

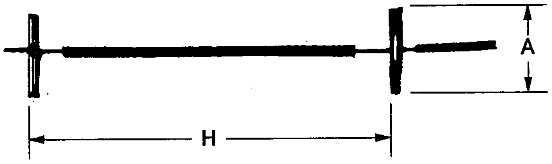


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	46 to 47

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
5) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
6) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 46 to 47.
   (Set the data of address 0C to the maximum value satisfying the specification.)
7) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

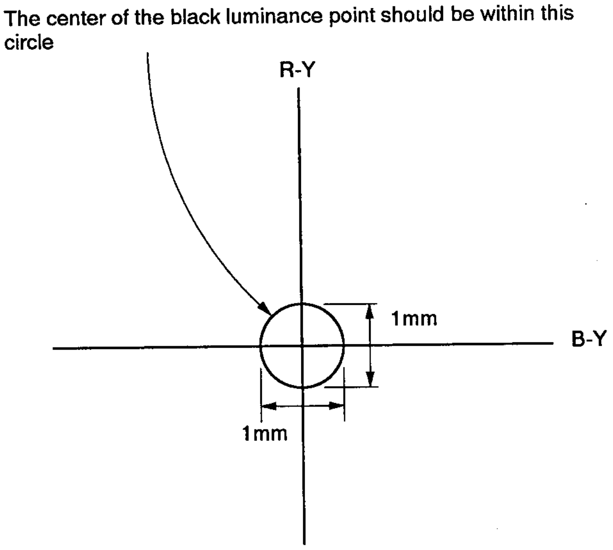

The center of the black luminance point should be within this circle
R-Y
1mm
B-Y
1mm

Fig. 7-10.

15. Picture Frame Setting

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus knob.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period

2. Vertical period

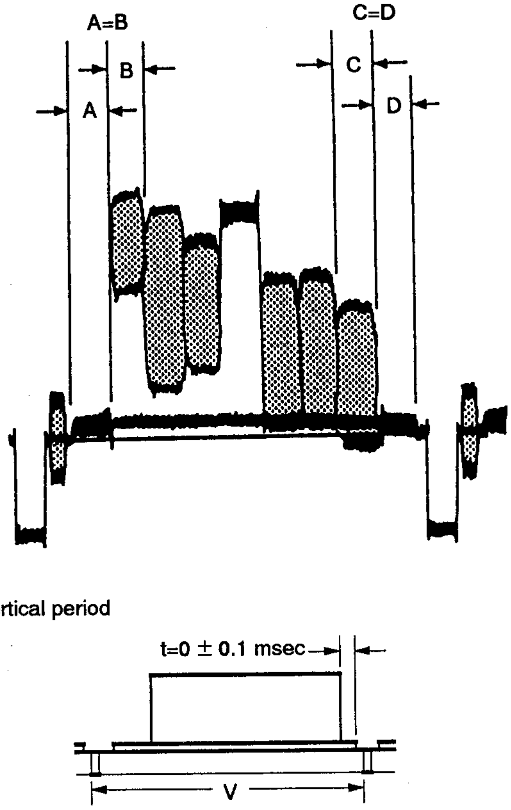
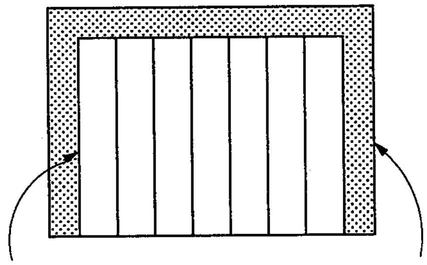


Fig. 7-11.

Check on the TV monitor



Color bar chart picture frame TV monitor picture frame

Fig. 7-12.

16. IRIS Level Adjustment (VC-133 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=200 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

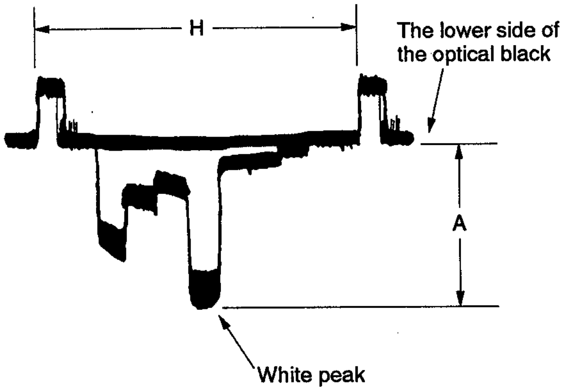


Fig. 7-13.

17. MAX GAIN Adjustment (VC-133 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=250 ± 5 mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.
5) Remove the ND filter 2.5.

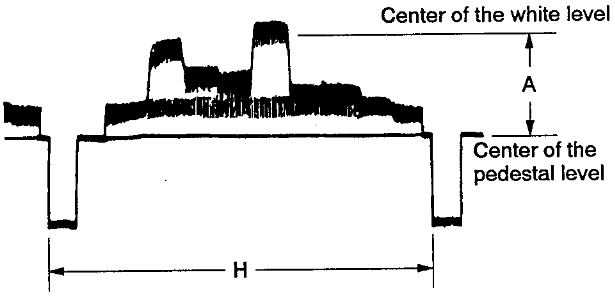


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point	DDS display of the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
5) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
6) Set data: 09 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
7) Read the DDS display data and set to D3A.
8) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.5 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

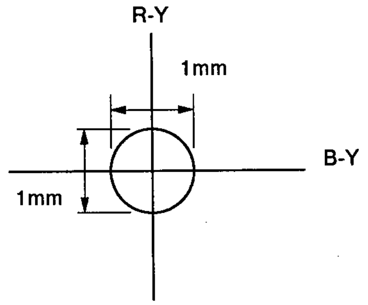


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B–Y GAIN), 19 (CORE R–Y GAIN), 1A (CORE R–Y HUE), 1B (CORE B–Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

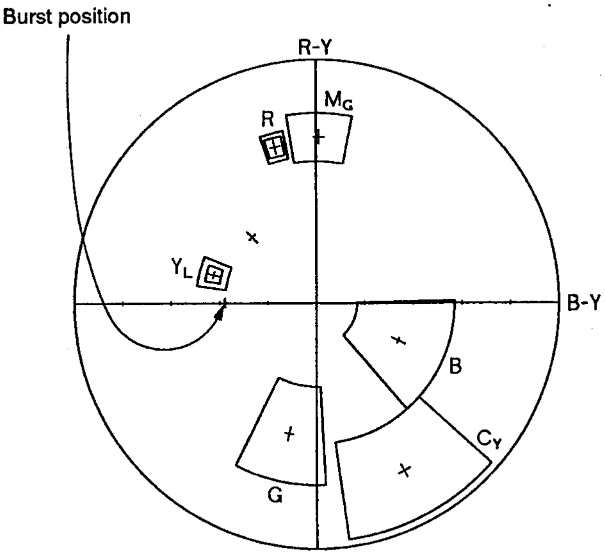


Fig. 7-16.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

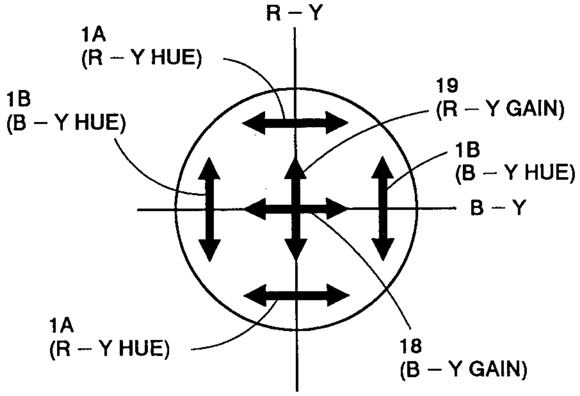


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01 and press the PAUSE button of the adjustment remote control unit.
   (Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting).

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 30 (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
   (Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00, and wait at least 2 seconds.
   (Camera adjustment mode 2 setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
   (Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode 2)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2A80 ± 40 B ratio 5A80 ± 40

Note: Check that "Auto White Balance Preset Adjustment" have been completed.

Adjusting method:

1) Place the C14 filter for color temperature correction on the lens.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
3) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance adjustment mode setting)
4) Set data: 82 to page: F, address: AF.
   (R ratio display mode setting)
5) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2A80 ± 40.
6) Press the PAUSE button of the adjusting remote control unit.
7) Set data: 83 to page: F, address: AF.
   (B ratio display mode setting)
8) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5A80 ± 40.
9) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode 2)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
   (Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance high speed tracking mode setting)
7) Set data: 91 to page: F, address: AF (R, B ratio (M) display mode setting), and check that the top 2 digits and bottom 2 digits of the DDS display are 3D to 43. Or check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
8) Place the C14 filter on the lens.
9) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
   (Auto white balance outdoor mode check)
10) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
11) Remove the ND filter.
12) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
   (Auto white balance outdoor mode check)

Processing after completing adjustments

1) Set data: 10 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance fast tracking mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode 2)
3) Set data: 00 to page: 6, address: 01, and press the PAUSE button.

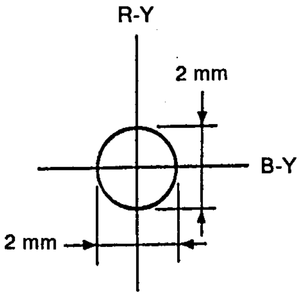


Fig. 7-18. A

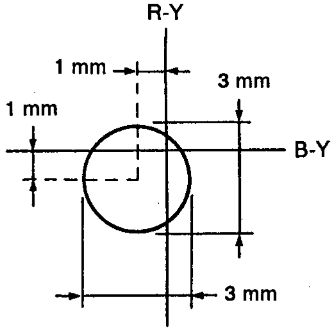


Fig. 7-18. B

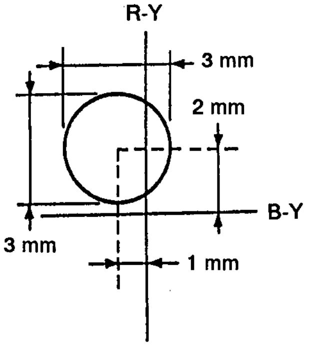


Fig. 7-18. C

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "15. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   2. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 02 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y data display mode setting)
6) Read the average value of the DDS display data (Note 2), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Select page: F and read the average value of the DDS display data (Note 2), and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
    1. Set data: C9 to page: 1, address: E6.
    2. Set data: B6 to page: 1, address: E7.
11) Select page: F and read the average value of the DDS display data (Note 2), and set to Y_2.
12) Specifying the Red position
    1. Set data: 59 to page: 1, address: E6.
    2. Set data: 6D to page: 1, address: E7.
13) Select page: F and read the average value of the DDS display data (Note 2), and set to R_2.
14) Convert Y_1, R_1, Y_2, R_2 to decimal notation to obtain Y_1', R_1', Y_2' and R_2'.
    (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
15) Calculate X_1' from the following equation (decimal notation calculation).
    $X_1'=Y_2'-Y_1'$
16) Calculate D_{3D} from the following table
    (D_{3D} is hexadecimal notation)

X_1' value	D_{3D}
$-1 \leqq X_1' \leqq 1$	F0
$X_1' > 1$	F1
$X_1' < -1$	FF

17) Set data: D_{3D} to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
18) Calculate X_2' from the following equation (decimal notation calculation).
    $X_2'=R_2'-R_1'$
19) Calculate D_{3E} from the following table.

X_2' value	D_{3E}
$X_2' \geqq 0$	00
$0 > X_2' \geqq -1$	01
$-1 > X_2'$	02

20) Set data: D_{3E} to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 2C to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y data display mode)
4) Turn the main power supply (6.3V) off.

Note 2: The right two digits of the display data at the bottom right of the EVF or monitor TV. The R–Y data is above 80. When the DDS display data is below 80, set data: 01 to page F, address: AF and press the PAUSE button of the adjusting remote control unit.

25. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=680 ± 40 mV SYNC level=285 ± 20 mV BURST level=280 ± 30 mVp-p

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

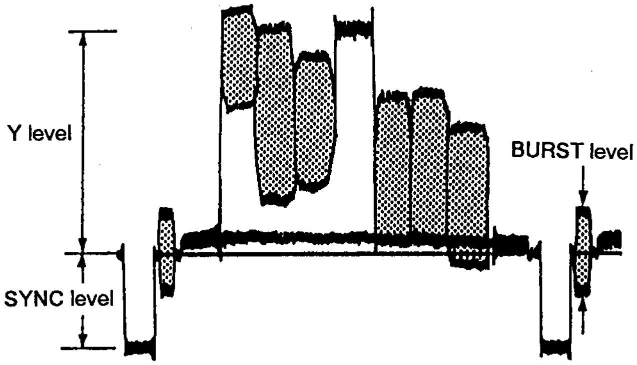


Fig. 7-19.

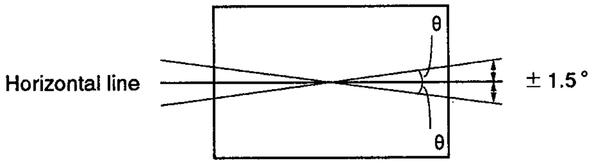
7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENTS

7-3-1. Horizontal Slant Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Specified Value	Refer to Fig. 7-21.

Adjusting method:

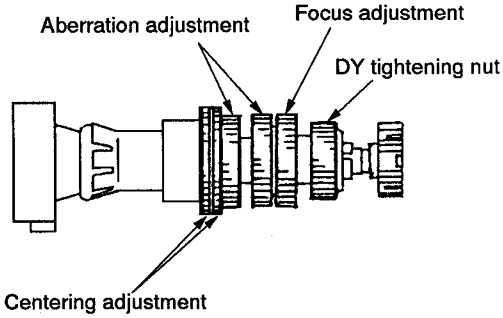
1) Adjust RV504 (BRIGHT) so that the CRT can be seen easily and clearly.
2) Loosen the DY (deflection yoke) tightening nut.
3) Rotate DY, and adjust the image so that it is horizontal.
4) Tighten the DY tightening nut.
   (Do not tighten it too tightly.)



Horizontal line
θ
θ
± 1.5 °

Specified value: The image should be within ± 1.5 ° of the horizontal line.

Fig. 7-21.



Aberration adjustment
Focus adjustment
DY tightening nut
Centering adjustment

Fig. 7-22.

7-3-2. Centering Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Specified Value	Refer to Fig. 7-23.

Adjusting method:

1) Use the centering adjustment ring and adjust so that the left, right, top, and bottom sides of the display are uniform. (Refer to Fig. 7-22.)

   Note: As the centering position changes due to earth magnetism, rotate it 360 ° in the horizontal direction, and adjust with the center section of the modifying position.

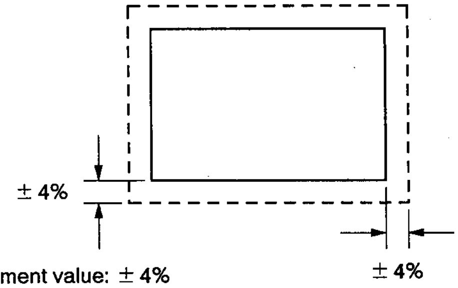


Fig. 7-23.

7-3-3. Focus Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section

Adjusting method:

1) Adjust the focus ring to obtain the optimum focus. (Refer to Fig. 7-22.)

7-3-4. Aberration Adjustment

Model	E-E
Signal	Dot pattern
Specified Value	Refer to Fig. 7-24.

Adjusting method:

1) Adjust the aberration adjustment ring so that the tracing of the dot becomes less than twice the diameter of the dot, or the fan aberration becomes less than the diameter of the dot.
2) If the centering becomes displaced here, perform the centering adjustment from the beginning again.

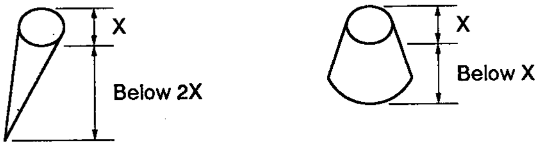


Fig. 7-24.

7-3-5. Horizontal Oscillation Frequency Adjustment (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP)
Measurement Point	Positive pole terminal of C516
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV501
Specified Value	2.60 ± 0.05 Vdc

Adjusting method:

1) Adjust to 2.60 ± 0.05 Vdc using RV501.

7-3-6. Horizontal Amplitude Adjustment (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	C504
Specified Value	6 ± 2%

Adjusting method:

1) Rotate RV502, and adjust the top and bottom sides of the monoscope image to the top and bottom edges of the display.
2) Rotate RV504 so that the brightness is the normal level.
3) Adjust the pattern (A) of the H size adjustment capacitor (C504) to "short" or "open", so that the horizontal direction over scan becomes 6 ± 2% (Left and right totals). (Refer to Fig. 7-26.)

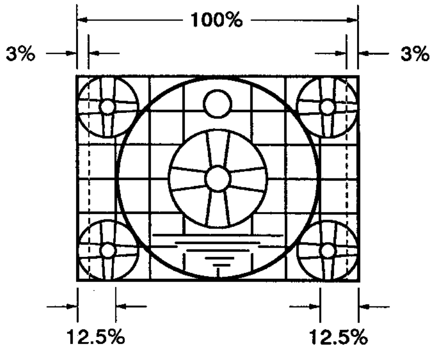
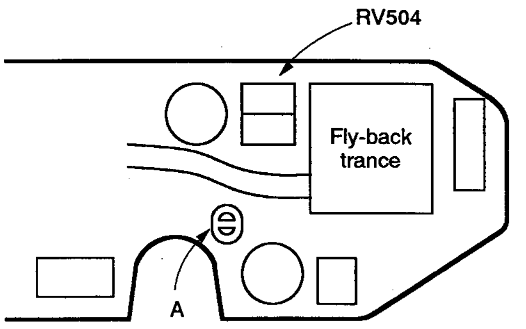


Fig. 7-25.



VF-42 board (Component side)

Section A	Size H
Open	Small
Short	Big

Fig. 7-26.

7-3-7. Vertical Amplitude Adjustment (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	RV502
Specified Value	5 ± 2%

Adjusting method:

1) Adjust RV502 so that the vertical direction over scan becomes 5 ± 2% (Top and bottom totals).

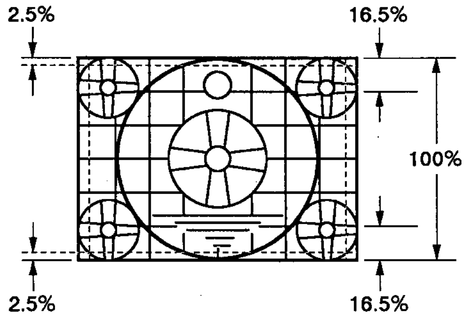


Fig. 7-27.

7-3-8. Brightness, Contrast Adjustments (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	Brightness: RV504 Contrast: RV503

Adjusting method:

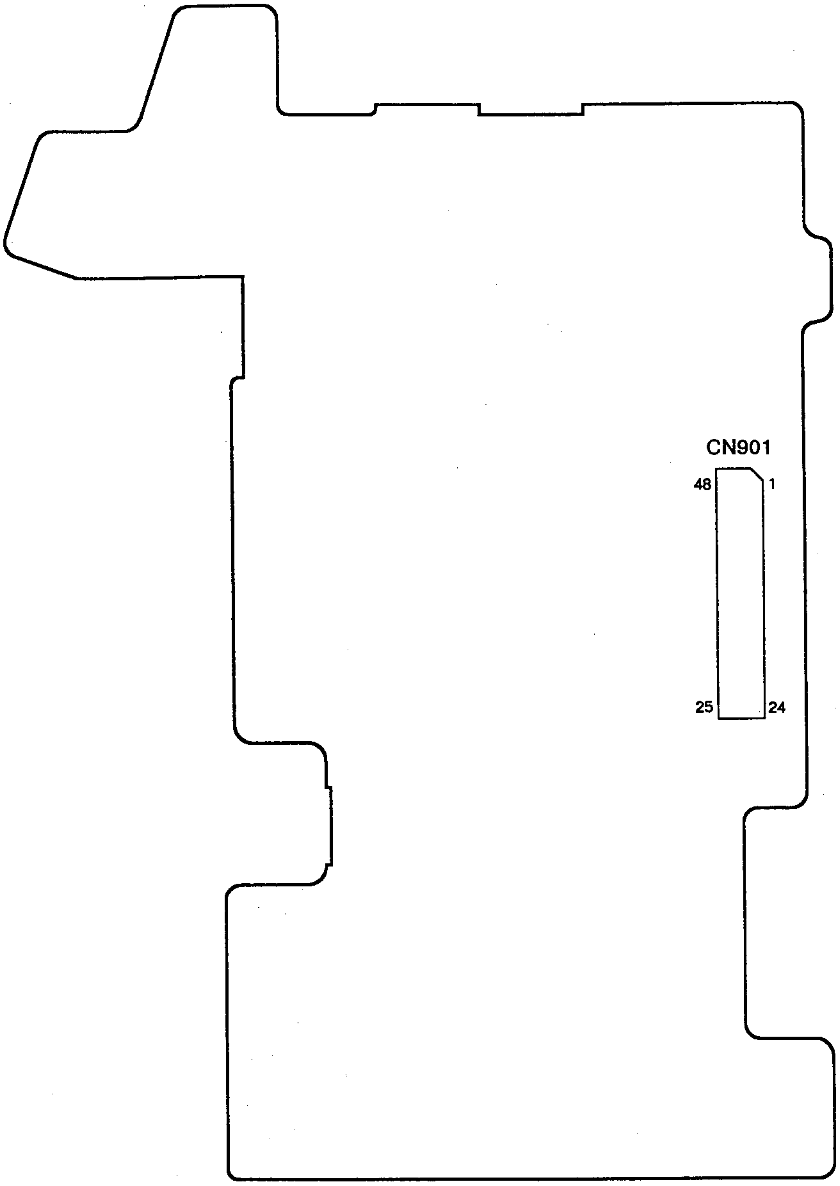
1) Rotate RV504 and RV503 alternately, and adjust so that the bright/dark sections of the gray scale are displayed correctly. (The bright section should be unsatisfactory till the cross hatch appears vague in the monoscope circle. The dark section should be unsatisfactory till the darkest section and the second darkest section of the gray scale cannot be differentiated.)

7-3-9. Horizontal Amplitude, Vertical Amplitude, Focus Check

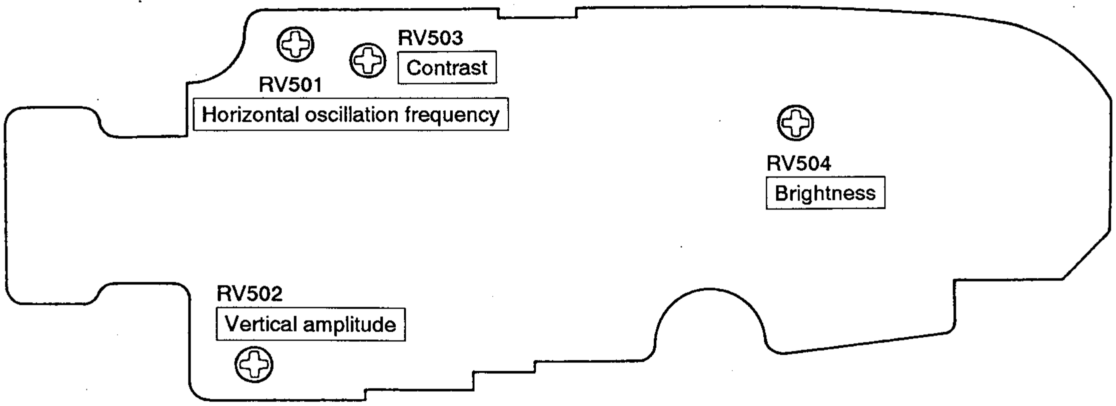
"7-3-6. Horizontal Amplitude Adjustment" and "7-3-7. Vertical Amplitude Adjustment" should both satisfy the specified values. If not, perform the adjustments from the beginning again. In this case, perform [7-3-8. Brightness, Contrast Adjustments] again. Moreover, check the focus, and if it found to be vague, perform "7-3-3. Focus Adjustment" and "7-3-4. Aberration Adjustment".

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

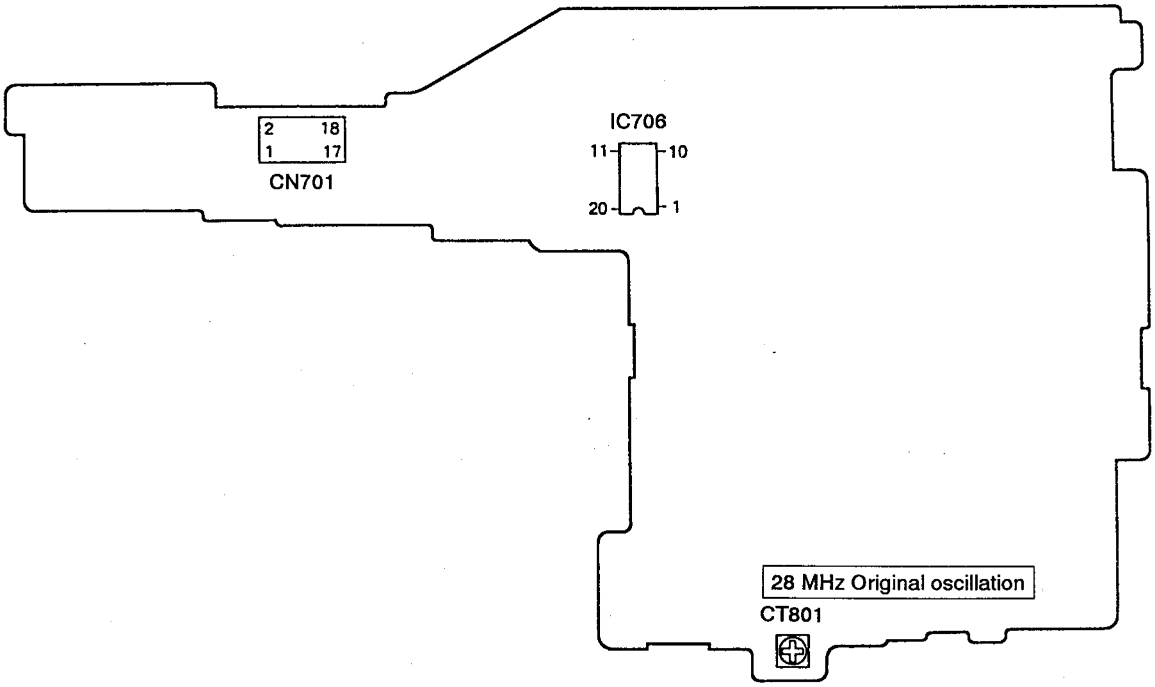
DD-56 BOARD (COMPONENT SIDE)


CN901
48
1
25
24

VF-42 BOARD (COMPONENT SIDE)

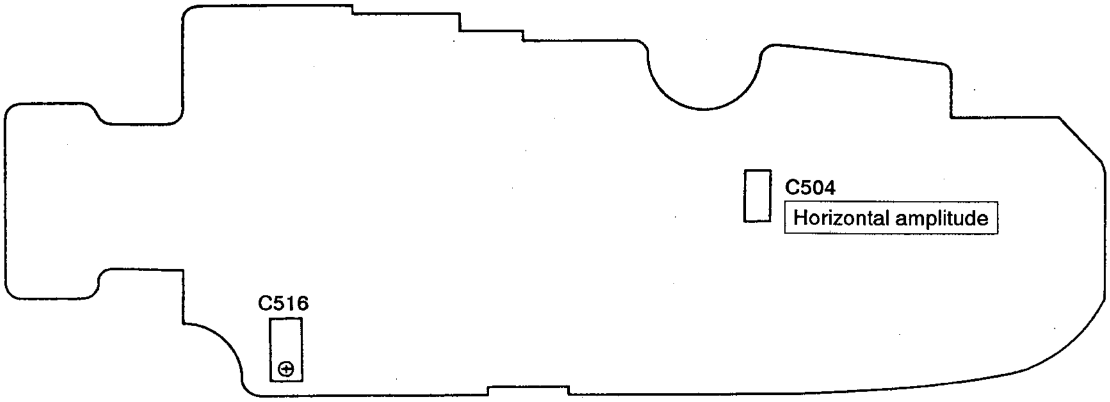

RV503
Contrast
RV501
Horizontal oscillation frequency
RV504
Brightness
RV502
Vertical amplitude

VC-133 BOARD (CONDUCTOR SIDE)



2
18
1
17
CN701
IC706
11
10
20
1
28 MHz Original oscillation
CT801

VF-42 BOARD (CONDUCTOR SIDE)



C504
Horizontal amplitude
C516

SECTION 8
MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

Refer to the separate volume of mechanical adjustment "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ (A Mechanism)" for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)

For setting of the track shift mode, however, refer to the following.

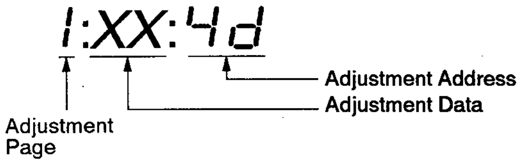
8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Set page: 1, address: 01 and data: 01, and then release the protector.
3) Set page: D and address: 01.
4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.

   (When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)
5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1: VS-100 board CN002 pin ③ (PB RF)
   CH2: VS-100 board CN002 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1NP: 8-967-995-02).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet side. (Refer to Fig. 8-1 and 8-2)
   If not flat, perform necessary adjustment according to the separate 8 mm Video Mechanical Adjustment Ⅳ (A Mechanism).

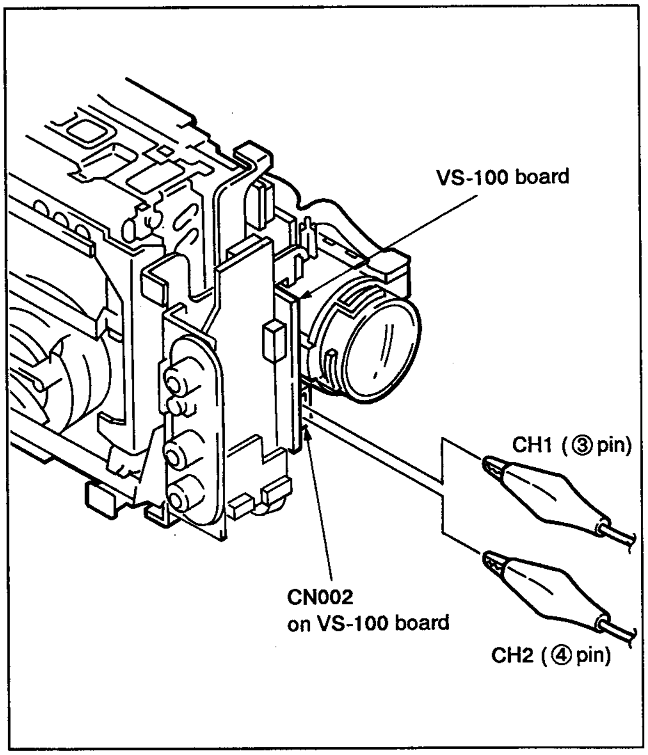


Fig.8-1.

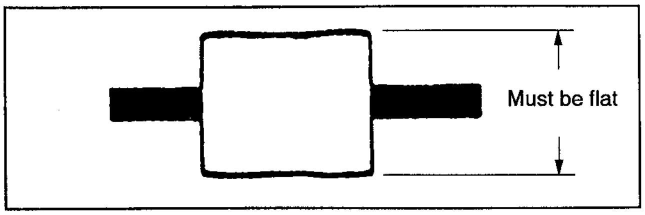


Fig.8-2.

SECTION 9

VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 246.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

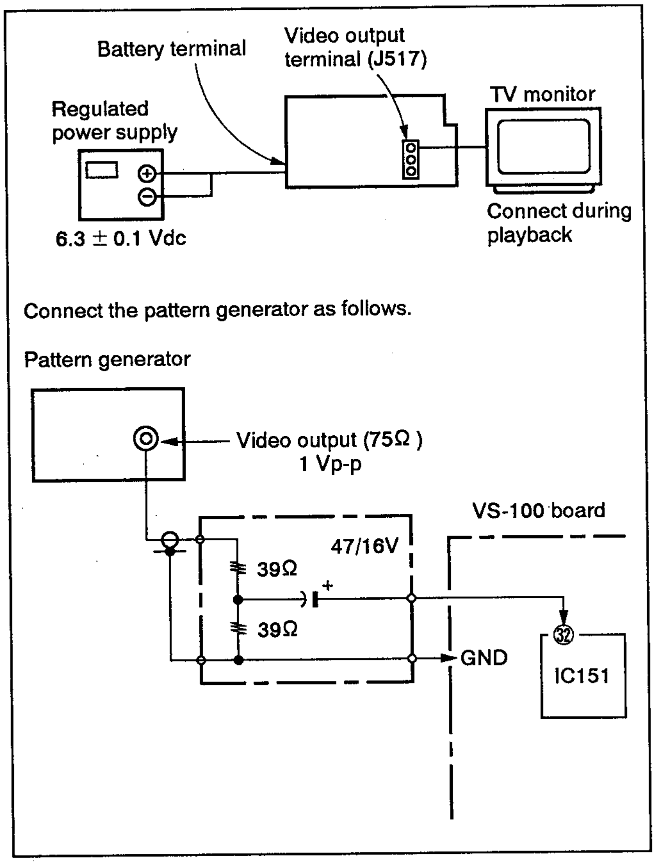
9-1-1. Equipments to be used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)
    Part Code: 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)
    Part Code: 8-967-995-12
    For checking operations
    (WR5-4NL)$^{\text{Note 1}}$
    Part Code: 8-967-995-51
    (WR5-5NSP)$^{\text{Note 2}}$
    Part Code: 8-967-995-42
    Note: The following alignment tapes can also be used.
    1) WR5-3NL (8-967-995-31)
    2) WR5-4NSP (8-967-995-41)
12) Remote control unit for adjustment (J-6082-053-B)
13) DD-56 board extension cord (42P, 0.8 mm)
    Part Code: J-6082-195-A
14) AU-150 board, Cabinet (R) extension cord (32P, 0.8 mm)
    Part Code: J-6082-249-A
15) Mecha deck extension cord (30P, 0.8 mm)
    Part Code: J-6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/player power switch ········Position of the player
- Connect the adjusting remote control unit to the remote terminal (DD-56 board CN902).


Battery terminal
Video output terminal (J517)
Regulated power supply
TV monitor
Connect during playback
6.3 ± 0.1 Vdc

Connect the pattern generator as follows.

Pattern generator
Video output (75Ω)
1 Vp-p
VS-100 board
47/16V
39Ω
39Ω
GND
32
IC151

Fig. 9-1.

9-1-3. How to Set the REC Mode

1. REC key forbidden accept mode cancel
   1. Connect the adjustment remote controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on the HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 4B [6B].[Note 1] (REC key forbidden accept mode cancel)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

The REC key is accepted through the above procedure.

2. REC mode setting
   1. Connect the collector of Q200 on the VS-100 board and GND with a jumper wire. (CCD delay (IC154) active mode setting)
   2. Turn on the HOLD switch of the adjustment remote controller.
   3. Select the page: 1 address: A3, and set data to 01.
   4. Select the page: 1 address: 0B, and set data to C8. (Line input mode setting)
   5. Turn off the HOLD switch of the adjustment remote controller.
   6. Press REC buttons of the adjustment remote controller.
   7. Remove the jumper wire and perform "3. Procedure after completed the adjustment", after completing adjustment.

3. Procedure after completed the adjustment
   Be sure to return the mode to REC key forbidden accept mode after adjustment.
   1. Connect the adjustment remoter controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 4A [6A].[Note 1] (Setting of the REC key forbidden accept mode)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

Note 1: No mark : US, Canadian Model
[ ] : E model

9-1-4. Precautions upon adjustment

The EVF (Electronic viewfinder) is not required for adjusting the video section.
Remove the following connector when removing the EVF section.

1. VS-100 board CN102 (6 PIN)

The front panel section assembly is not required for adjusting the video section. Remove the following connectors when removing the front panel section assembly.

1. AU-150 board CN601 (5 PIN)

The cabinet (R) is required for adjusting the video section. Use the extension cord (J-6082-196-A) when adjusting the video section.

9-1-5. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ㉜ of IC151 on the VS-100 board, and check that the amplitude of the sync signal of the video signal is approximately 0.15V, the amplitude of the video section is approximately 0.35V, the amplitude of the burst signal is approximately 0.15V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

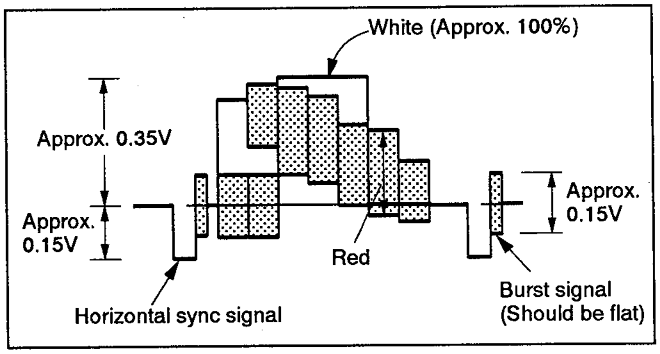


Fig. 9-2. Color Bar Signal of the Pattern Generator

9-1-6. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment. If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record-ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1NP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6N	L	MP	SP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5NSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. } Color bar section 400 Hz 20 sec. 14 kHz 20 sec. Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4NL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		

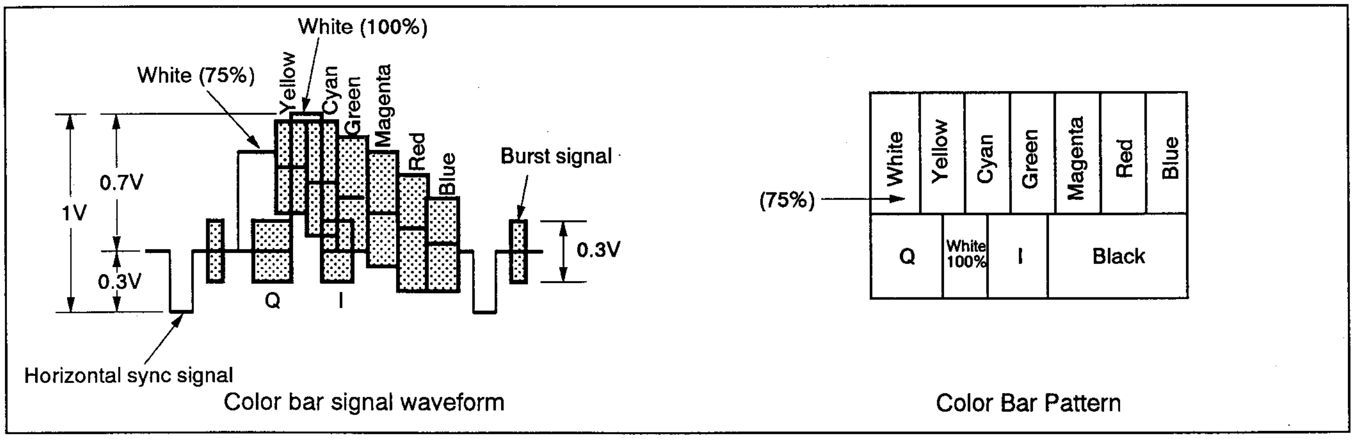
Note: Recording mode
L ······· Conventional mode
E ······· hi8 (hi band) mode

Tape type
MP····· Particle type metal tape
ME····· Evaporated type metal tape

Table 9-1.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure using the video input/output terminal (Terminated at 75 Ω)



Color bar signal waveform

Color Bar Pattern

Fig. 9-3. Color Bar Signals of the Alignment Tape

9-1-7. Output Level and Impedance

Video output	Phono jack Output signal: 1 Vp-p, 75 unbalanced, sync negative
Audio output	Phono jack Specified output: –7.5 dBs (at load impedance 47 kΩ) Output impedance: Below 2.2 kΩ

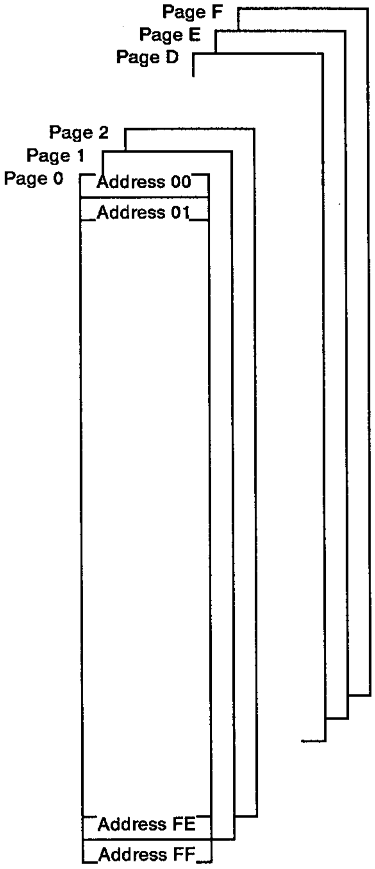
9-1-8. Service Mode

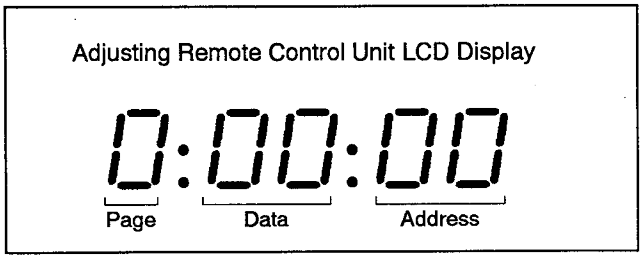
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).

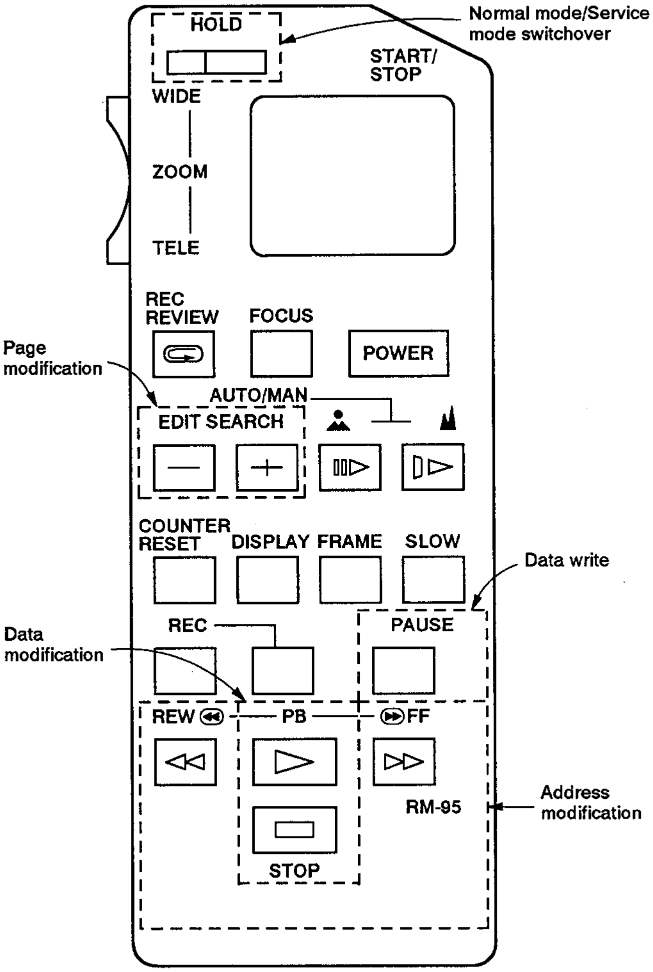
(1) Service LANC memory map


Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF


Adjusting Remote Control Unit LCD Display

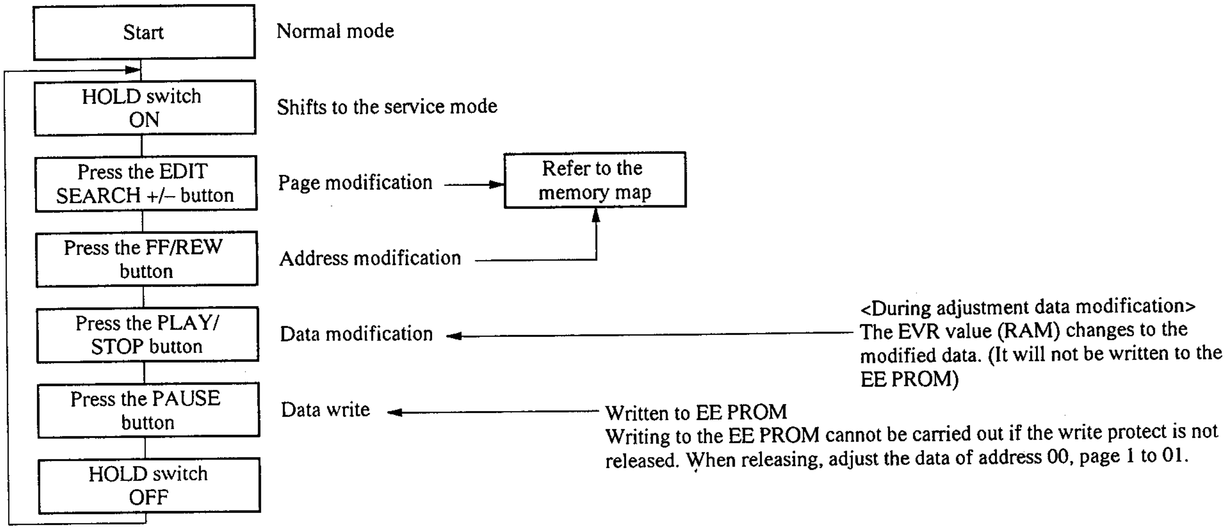
0:00:00
Page
Data
Address

Adjusting remote control unit RM-95 (J-6082-053-B)


HOLD
Normal mode/Service mode switchover
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page modification
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
Data write
REC
PAUSE
Data modification
REW
PB
FF
RM-95
Address modification
STOP

Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
Press the PAUSE button
Data write
HOLD switch OFF

<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)

Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 1 to 01.

Command Name	Command Function	Normal LANC command
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data..

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment (Not used) SP/LP automatic distinction inhibition, manual switchover
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

……The first error code generated

Page D	Address 07

Last emergency code

…… The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode
……The operation mode when the first error is generated

Page D	Address 09

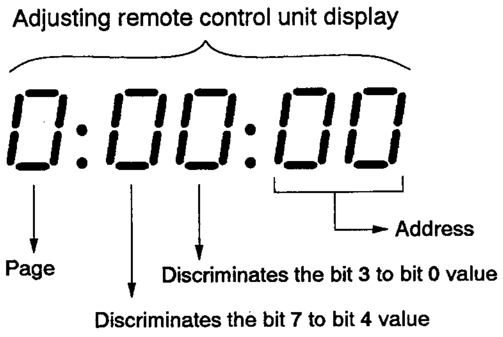
Last emergency mode
……The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.
※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.
※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	–X1
37	–1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	–1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	–X2
77	–FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(–)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.


Adjusting remote control unit display
0:00:00
Address
Page
Discriminates the bit 3 to bit 0 value
Discriminates the bit 7 to bit 4 value

	Remote Control Unit Display	Bit Value			
		bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ→	8	1	0	0	0
	9	1	0	0	1
	A (A)	1	0	1	0
	B (b)	1	0	1	1
	C (c)	1	1	0	0
	D (d)	1	1	0	1
Ⓑ→	E (E)	1	1	1	0
	F (F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	

"1"=Recording impossible
"0"=Recording possible

"1"=ME tape
"0"=MP tape

"1"=Hi8 mode playback
"0"=Normal mode playback

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC DOWN}}$		

"0"=During cassette compartment lock

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

"1"=LP mode playback
"0"=SP mode playback

"1"=SYNC is detected
"0"=SYNC is not detected

"1"=CLOG is detected
"0"=Normal

"1"=When the PB RF signals are being playback normaly
"0"=Others

"1"=JOG mode
"0"=Other

"1"=Playback mode
"0"=Others

"1"=AUDIO MUTE: ON
"0"=AUDIO MUTE: OFF

"1"=VIDEO MUTE: ON
"0"=VIDEO MUTE: OFF

Page 1	Address 42

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
						DEW	

"0"=Dew outbreak
"1"=Others

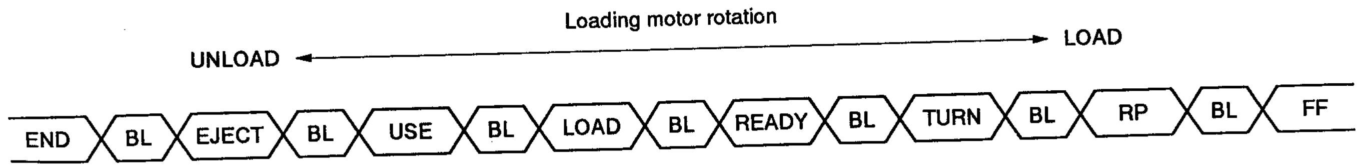
10. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

MSW 0	MSW 1	MSW 2	POSITION	FUNCTION	$\overline{\text{CC DOWN}}$
1	1	1	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB↔REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0


Loading motor rotation
UNLOAD
LOAD
END
BL
EJECT
BL
USE
BL
LOAD
BL
READY
BL
TURN
BL
RP
BL
FF

11. Mechanism Control A/D Port Input Voltage Check

Page 4	Address 14

Checking method:

1) Set data: 02 to page: 4, address: 0E.
   (A/D conversion processing active)
2) Set the data in the following table to page: 4, address: 13, and select the A/D port to be displayed.

Data	A/D Port
00	Pin (62): AN0 (T REEL FG)
01	Pin (61): AN1 (S REEL FG)
02	Pin (60): AN2 (ATF ERROR)
03	Pin (59): AN3 (BATT SENS)
04	Pin (58): AN4 ($\overline{\text{DEW}}$)

3) Check the data of page: 4, address: 14.

Adjusting Remote Control Unit Display Data	A/D Port Input Voltage
FF to 00	Approx. 5 Vdc to 0 Vdc

12. Tape Top/End Sensor Condition Check

Page 4	Address 0A

Checking method:

1) Set data: 10 to page: 4, address: 0E.
   (Tape top/end sensor condition sampling processing active)
2) Check the data of page: 4, address: 0A.

Adjusting Remote Control Unit Display Data	Tape Top/End Sensor Condition
0 0	Tape present (Middle of tape)
0 1	Tape end
1 0	Tape top
1 1	No tape

Tape end sensor condition
Tape top sensor condition

"0"=Non-active (Not receiving light)
"1"=Active (Receiving light)

13. Battery Voltage Check

Page 4	Address 10

Adjusting Remote Control Unit Display Data	Battery Voltage
FF	Approx. 10 Vdc
F0	Approx. 9.4Vdc
E0	Approx. 8.8Vdc
D0	Approx. 8.2Vdc
C0	Approx. 7.5Vdc
B0	Approx. 6.9Vdc
A0	Approx. 6.3Vdc
90	Approx. 5.6Vdc
80	Approx. 5.0Vdc

14. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
01	All motors stop
03	
05	
07	
09	
0B	
0D	
0F	

15. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		LENS COVER OPEN (MF-214 S973)	VTR POWER (VK-32 S977)		PAUSE (VK-32 S984)	EDIT SEARCH (+) (VK-32 S981)	EJECT (DD-56 S901)	
Address 69 (K OUT 1)		BUZZER ON/OFF (ED-37 S986)	CAMERA POWER (VK-32 S977 SW-223 S519)	FF (VK-32 S983)	PLAY (VK-32 S980)	REW (VK-32 S979)	STOP (VK-32 S976)	
Address 6A (K OUT 2)		TWILIGHT (CF-34 S997)				EDIT SEARCH (–) (VK-32 S978)	COUNTER RESET (CF-34 S995)	EDIT ON/OFF (ED-37 S990)
Address 6B (K OUT 3)		PORTRAIT (CF-34 S997)			TIME (CF-34 S996)	DATE (CF-34 S993)		
Address 6C (K OUT 4)		SPORTS (CF-34 S997)		AUTO FOCUS ON/OFF (MF-214 S971)				
Address 6D (K OUT 5)		HIGH SPEED SHUTTER (CF-34 S997)	AREA (ED-37 S989)	DST or SUMMER TIME (ED-37 S987)		FADER (CF-34 S991)	START/ STOP (SW-223 S520)	REMOTE COMMANDER (ED-37 S988)

"1"=key switch ON
"0"=key switch OFF

16. Wireless Remote Control Unit Reception Content Check

Page 1	Address 1E

Wireless remote control unit key pressed	**Data**
None	FF
TELE	9A
WIDE	9B
Start/stop	99
Rewind	1B
Fast forward	1C
Stop	18
Playback	1A
Data screen	5A
Pause	19
SLOW	23

17. EDIT Switch, Remote Commander Switch Check

Page 1	Address 0A

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
REC MODE (SP/LP)	REMOTE COMMANDER		EDIT				

Bit7:
"1"=LP
"0"=SP

Bit6:
"1"=OFF
"0"=ON

Bit4:
"1"=EDIT ON
"0"=EDIT OFF

18. White Balance Mode and Focus Mode Display/Switchover

Page 1	Address 9A

The mode can be switched when the data of page: 1, address: A3 is set to 04.

Data	White Balance Mode
∗ 1	INDOOR
∗ 2	OUTDOOR
∗ 3	HOLD
∗ 6	AUTO

Data	Focus Mode
0 ∗	Manual
1 ∗	Automatic

∗ : 0 to F

19. LCD, LED Check, etc.

Page 1	Address A3

Data	Mode
00	Normal
01	Key input prohibited
04	Camera function renewal prohibited

20. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

*1 No mark : US, Canadian model
[ ] : E model

Address	**Name**	**Function** **[ ] indicate the adjustment voltage output terminal**	**Adjustment data**	
			Initial value	**Memo column**
00	Category code	Not used	00	00
01	Test mode		4A[6A]*1	4A[6A]*1
02	Destination flag		8C	
03	BATT END	Battery end adjustment	00	
04	SW POSITION	SW POSITION adjustment	0A	
05	SW POSITION	SW POSITION adjustment	00	00
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		24	24
0A	SR DATA (MP Normal SP)	CXA1207 serial data	3E	3E
0B	SR DATA (MP Normal LP)	CXA1207 serial data	24	24
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	3E	3E
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	24	24
0E	SR DATA (ME Normal SP)	CXA1207 serial data	3E	3E
0F	SR DATA (ME Normal LP)	CXA1207 serial data	24	24
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	3E	3E
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	3E	3E
12	SR DATA (EDIT ON Normal)	CXA1207 serial data	3E	3E
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data		
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue]. Not used		
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue]. Not used		
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green]. Not used		
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green]. Not used		
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue]. Not used		
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue]. Not used		
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red]. Not used		
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red]. Not used		
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet]. Not used		
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet]. Not used		
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow]. Not used		
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow]. Not used		
20	Permission plug		44	44
21	Adjustment plug	FORCED VTR ON, CAM ON etc DATA — MODE 01 — FORCED CAMERA POWER ON 02 — FORCED VTR POWER ON	00	00
22~29		Not used		

Table 9-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
2A	SLOW ADJ (FOWARD)		00	00
2B	SLOW ADJ (REVERSE)		00	00
2C	STILL ADJ		00	00
2D	BATT REMAIN LEVEL 1	Amount of remaining battery 1	A0	
2E	BATT REMAIN LEVEL 2	Amount of remaining battery 2	99	
2F	BATT REMAIN LEVEL 3	Amount of remaining battery 3	94	
30~42		Not used		
43	1-ch M.T NORMAL	1 ch playback frequency characteristic adjustment [IC158 ②]	C0	
44				
45	2-ch M.T NORMAL	2 ch playback frequency characteristic adjustment [IC158 ③]	C0	
46	REC C RF (EE)	REC C RF level adjustment (EE) [IC156 ⑩]	B8	
47	REC C RF (PB)	REC C RF level adjustment (PB) [IC156 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC158 ⑤]	64	64
49	RF CONT (MP)	ATF RF level (MP) [IC158 ⑤]	70	70
4A	EE LEVEL	EE level adjustment [IC156 ⑮]	70	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC156 ③]	A8	
4D	SR-IR	IR adjustment [IC156 ②]	AE	
4E	Y-FM CARRIER (Hi8)			
4F	Y-FM CARRIER (NORMAL)	Y-FM carrier frequency adjustment [IC156 ⑤]	A8	
50	Y-FM DEVIATION (Hi8)			
51	Y-FM DEVIATION (NORMAL)	Y-FM deviation adjustment [IC156 ⑥]	95	
52	REC Y LEVEL (EE Hi8 ME)			
53	REC Y LEVEL (EE Hi8 MP)			
54	REC Y LEVEL (EE NOR ME)	REC Y recording current adjustment (ME) [IC156 ⑦]	95	
55	REC Y LEVEL (EE NOR MP)	REC Y recording current adjustment (MP) [IC156 ⑦]	95	
56	REC Y LEVEL (PB)	Playback REC Y level [IC156 ⑦]	00	00
57	PB Y LEVEL (EE)	EE PB Y level [IC158 ⑮]	00	00
58	PB Y LEVEL (Hi8)			
59	PB Y LEVEL (NORMAL)	Normal PB Y level adjustment [IC158 ⑮]	B0	
5A	EMPHASIS INPUT LEVEL	EE emphasis input level adjustment [IC156 ④]	A5	
5B	PB LINE LEVEL	Playback emphasis input level adjustment [IC156 ④]	AF	
5C~77		Not used		
78	REC MX	REX matrix adjustment [IC158 ⑫]	B0	
79	PB MX	PB matrix adjustment [IC158 ⑫]	A0	
7A	1.5 IR	1.5 MHz IR adjustment [IC158 ⑥]	A0	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC158 ⑦]	A0	
7C	1.7 IR	1.7 MHz IR adjustment [IC158 ⑧]	A0	
7D	1.7 DEV	1.7 MHz deviation adjustment [IC158 ⑨]	A0	
7E	AUDIO FADER	Audio fader [IC158 ⑦]		
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (DD-56 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q903 collector
Measuring Instrument	Frequency counter
Specified Value	510 ± 35 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (DD-56 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑪ of CN901
Specified Value	4.93 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑤ and ⑧ of CN901
Specified Value	4.92 ± 0.15 Vdc
D4V check	
Measurement Point	Pin ④ of CN901
Specified Value	3.98 ± 0.15 Vdc
VID 5V check	
Measurement Point	Pins ⑰, ⑳ of CN901
Specified Value	4.90 ± 0.15 Vdc
RP 5V check	
Measurement Point	Pin ㉒ of CN901
Specified Value	4.89 ± 0.15 Vdc
AU5V check	
Measurement Point	Pin ⑲ of CN901
Specified Value	4.90 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑦ and ⑩ of CN901
Specified Value	$4.86^{+0.15}_{-0.11}$ Vdc
CAM15V check	
Measurement Point	Pin ⑫ of CN901
Specified Value	15.05 ± 0.4 Vdc
CAM –9V check	
Measurement Point	Pin ⑨ of CN901
Specified Value	–8.5 ± 0.4 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "9-1-8. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7D

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN LEVEL 1) 2E (BATT REMAIN LEVEL 2) 2F (BATT REMAIN LEVEL 3)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

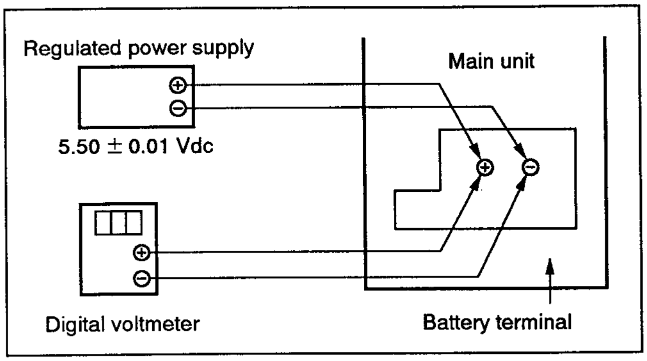


Fig. 9-4.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: D, address: 01.
   (Test mode 1 setting)
4) Set to the camera recording mode.
5) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 5.50 ± 0.01 Vdc.
6) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to DEND.
7) Set data DEND to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
8) Convert DEND to decimal to obtain DEND´. (Refer to Table 7-6. "Hexadecimal notation – decimal notation conversion table")
9) Obtain the adjustment data (decimal) by following formula (decimal notation calculation), convert to hexadecimal and enter the data into each adjustment address.

   Address: 2D D2D´=DEND´+18
   Address: 2E D2E´=DEND´+14
   Address: 2F D2F´=DEND´+8

   Note: After setting the data, be sure to press the PAUSE button of the adjusting remote control unit before changing the address.
10) Set data: 00 to page: D, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (Test mode 1 release)
11) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.70 ± 0.01 Vdc.
4) Check that the 🔋 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.58 ± 0.01 Vdc.
6) Check that the 🔋 mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.42 ± 0.01 Vdc.
8) Check that the 🔋 mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (VS-100 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ④ of CN002 (RF SWP) CH2: Pin ③ of CN002 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) 05 (SW POSITION)
Specified Value	t1=0 ± 10 μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0A to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Press the PAUSE button of the remote control unit.
5) Change the data of page: D, address: 04, and adjust so that the switching position (t1) becomes the specified value. (Fine adjustment)
6) Press the PAUSE button of the adjusting remote control unit.

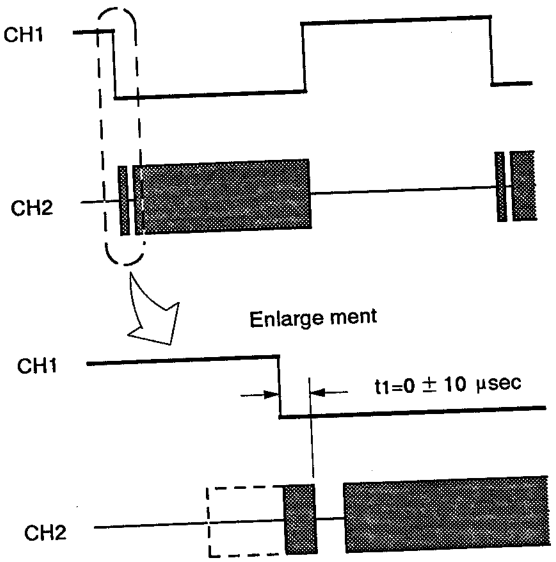


Fig. 9-5.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-2.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Y/C separation adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Deviation adjustment
12) Chroma emphasis f0 adjustment
13) REC Y level adjustment
14) REC C level adjustment
15) REC ATF level check
16) REC AFM level check

1. Playback Frequency Characteristic Adjustment (VS-100 board)

Note 1: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	CH1: Pin ③ of CN002 EXT TRIG: Pin ④ of CN002
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Confirm that the EDIT switch is OFF position.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.

   Note 2: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

   Note 3: If the waveform is not stable, set data: 03 to page: D, address: 01. (Test mode 3 setting)
   After completing adjustment, set data: 00 to page: D, address: 01.

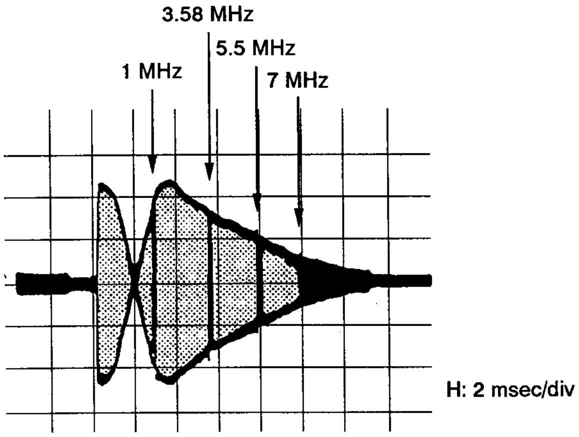


Fig. 9-6.

2. Flying Erase Check (VS-100 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of W001 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: approx. 7.5 MHz Voltage: Above 1.5 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is approx. 7.5 MHz and that the oscillation voltage is above 1.5 Vp-p.

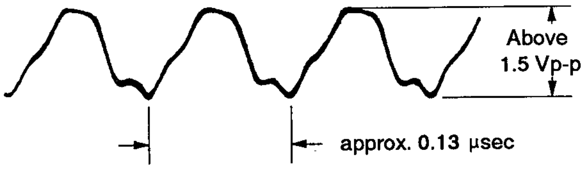


Fig. 9-7.

3. VXO Oscillation Frequency Check (VS-100 board)

Mode	STOP
Signal	Color bar
Measurement Point	Pin ⑫ of IC152
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC152 is 3579545 ± 70 Hz.

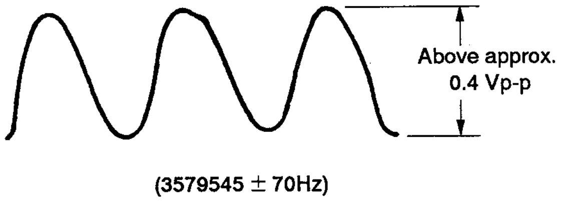


Fig. 9-8.

4. EE Level Adjustment (VS-100 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ② of CN101 (VIDEO OUT)[Note]
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=1.00 ± 0.025V

Note: Terminate pin ② of CN101 at 75 Ω.
After completing adjustments, remove the 75 Ω resistor.

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

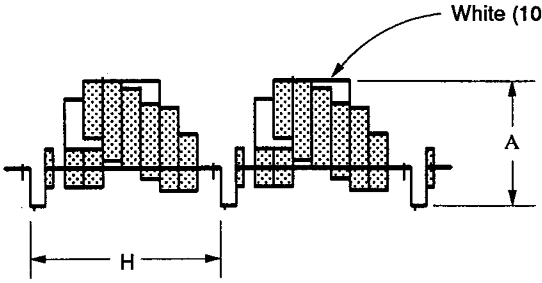


Fig. 9-9.

5. IR Adjustment (VS-100 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC151 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 80 mVp-p)

Connection

1) Connect pin ⑭ of IC151 (VREF: 3.5 Vdc) or pin ② of IC159 to pin (51) of IC151 with a jumper wire.

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

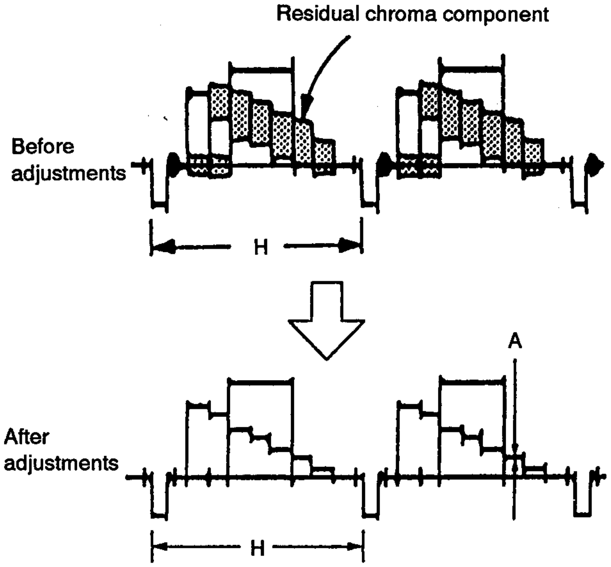


Fig. 9-10.

6. Y/C Separation Adjustment (VS-100 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC151 (C+CD)
Measuring Instrument	Oscilloscope
Adjusting Element	RV151 (Phase)
Adjustment Page	D
Adjustment Address	4C (Y/C SEP DL LEVEL)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV151 so that the residual chroma component (A) becomes minimum.
5) Press the PAUSE button of the adjusting remote control unit.

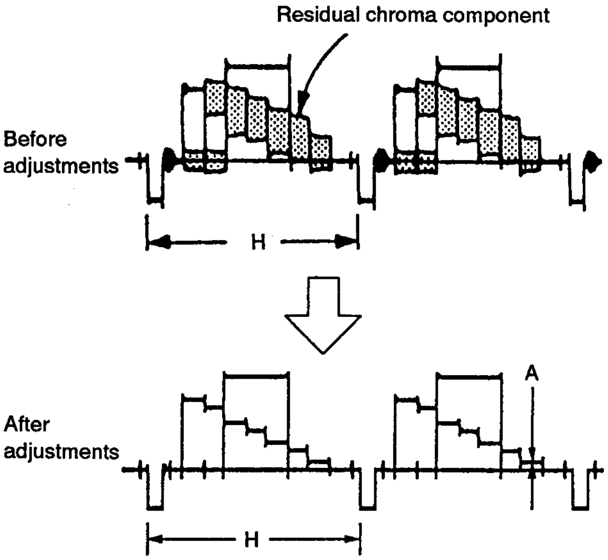


Fig. 9-11.

7. Emphasis Input Level Adjustment (VS-100 board)

Mode	E-E
Signal	Color bar without burst signal
Measurement Point	Pin ③ of IC155 (or Pin ③ of IC151)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPHASIS INPUT LEVEL)
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

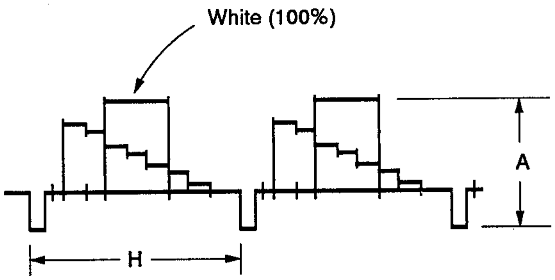


Fig. 9-12.

8. PB Y Level Adjustment (VS-100 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Pin ㉑ of IC151
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	• Normal mode 59 (NORMAL PB Y LEVEL)
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5NSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

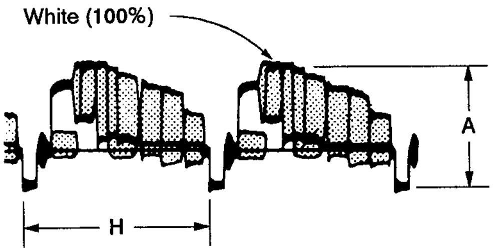


Fig. 9-13.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (PB LINE LEVEL)
Specified Value	A=1.0 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

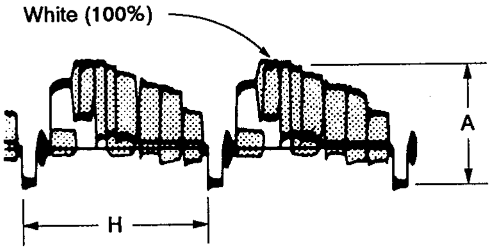


Fig. 9-14.

10. Y FM Carrier Frequency Adjustment (VS-100 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC003 (REC Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

Pin ⑤ of IC003 waveform

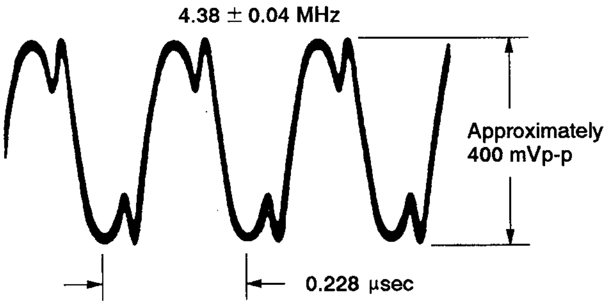


Fig. 9-15.

11. Deviation Adjustment (VS-100 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC151
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2) to 4).

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

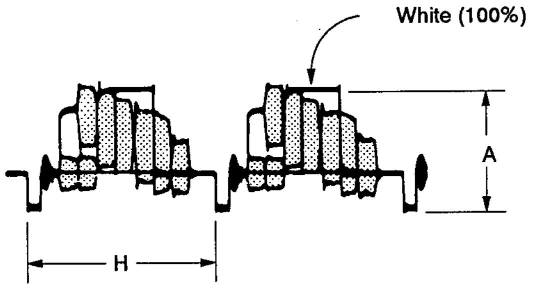


Fig. 9-16.

12. Chroma Emphasis fo Adjustment (VS-100 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ㉔ of IC152
Measuring Instrument	Oscilloscope
Adjustment Element	FL153
Specified Value	Minimum fo component

Connection:

1) Connect pin ㉔ of IC152 to GND with a 3.3 kΩ resistor (1-249-423-11).

Adjusting method

1) Adjust FL153 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

Minimize the amplitude of the latter section of the yellow section.

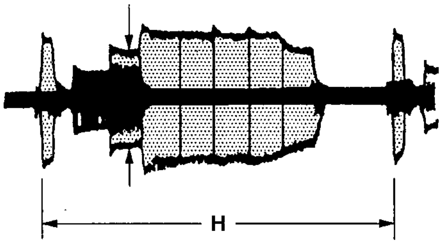


Fig. 9-17.

13. REC Y Level Adjustment (VS-100 board)

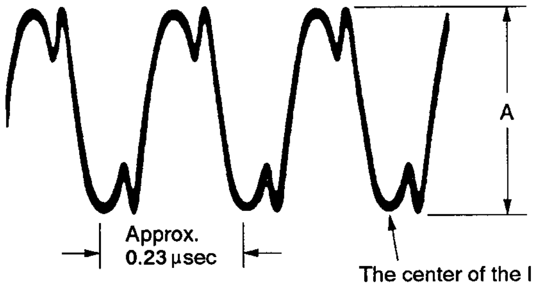
Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of IC003
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC Y LEVEL EE NOR MP) 54 (REC Y LEVEL EE NOR ME)
Specified Value	A=225 ± 5 mVp-p

Note: Use a MP type tape.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set the data of page: D, address: 55 to page: D, address: 54.
5) Press the PAUSE button of the adjusting remote control unit.

The center of the luminance line width of this section



The center of the luminance line width of this section

Fig. 9-18.

14. REC C Level Adjustment (VS-100 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ③ of IC003
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46 (REC C RF (EE))
Specified Value	A=120 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 46, and adjust so that the REC C level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

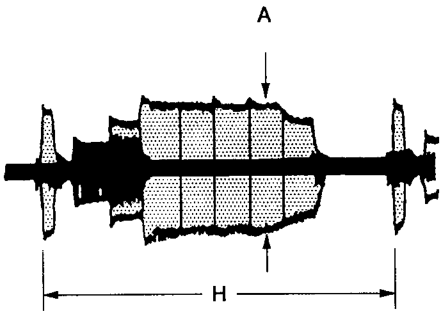


Fig. 9-19.

15. REC ATF Level Check (VS-100 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ㉔ of IC001 (REC 1CH)
Measuring Instrument	Oscilloscope
Specified Value	A=8 ± 2 mVp-p

Note: Use a MP type tape.

Connection:

1) Remove the AU-150 board CN602.

Checking method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) To reduce the REC Y signal, set data: 00 to page: D, address: 55.
   Note: Don't press the PAUSE button of the adjusting remote control unit.
3) Check that the REC ATF signal level (A) satisfies the specified value.
4) Turn the main power supply (6.3V) off.

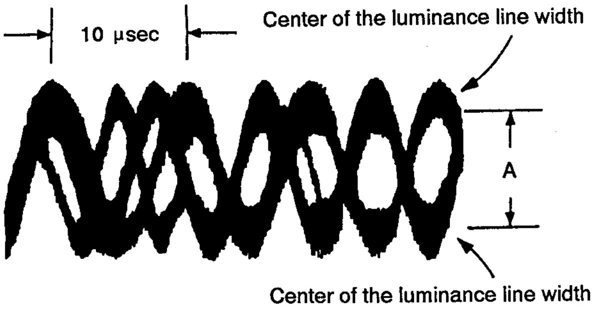


Fig. 9-20.

16. REC AFM Level Check (VS-100 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ㉔ of IC001 (REC 1CH)
Measuring Instrument	Oscilloscope
Specified Value	A=9 ± 2 mVp-p

Note: Use a MP type tape.

Connection:
1) Connect Pin ⑨ of IC404 and GND with a 0.01 μF capacitor (1-101-004-00).

Checking method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) To reduce the REC Y signal, set data: 00 to page: D, address: 55.
   Note: Don't press the PAUSE button of the adjusting remote control unit.
3) Check that the REC AFM signal level (A) satisfies the specified value.
4) Turn the main power supply (6.3V) off.

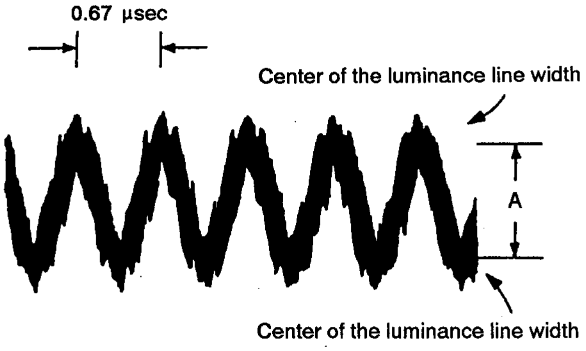


Fig. 9-21.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-22, and perform adjustments with the power switch [player] position.

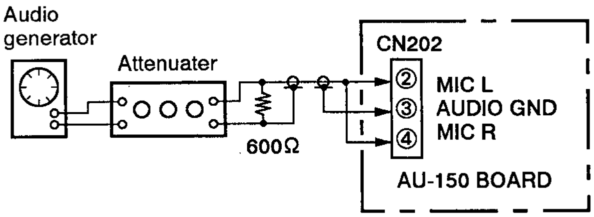
Note: 1) When inputting the audio signal, input the same signal to both L, and R channels, unless specified otherwise.

2) Be sure to insert the plug (shorting plug or dummy plug, etc.) into the audio output terminal (right). If the plug is not inserted, the unit will be set into the monaural mode, and correct adjustments cannot be carried out.
(Monaural mode)
During recording ·· REC AFM RF1.7 MHz carrier will not be output.
During playback ·· The L+R signal will be output from the audio input/output terminal (left).

3) The items to be adjusted for the R channel will be indicated within the [ ], in regard to the adjusting items to be adjusted for both L and R channels.

- Connection of Audio generator and attenuator except for "Overall Level Characteristic, Distortion Check", "Separation Check" and "Overall Noise Level Check".

Note: Remove the MA-170 board.



- Connection of Audio level meter or distortion meter

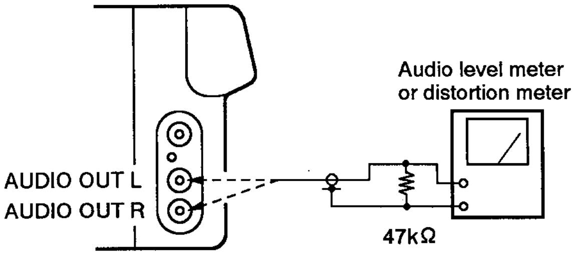


Fig. 9-22.

[Adjustment Procedure]

1) IR adjustment
2) 1.5 MHz carrier frequency check
3) 1.7 MHz carrier frequency check
4) 1.5 MHz recording level check
5) 1.7 MHz recording level check
6) E-E output level check
7) REC matrix L–R adjustment
8) REC matrix L+R check
9) 1.5 MHz deviation adjustment
10) 1.7 MHz deviation adjustment
11) PB matrix L adjustment
12) PB matrix R check
13) Overall level characteristics, distortion check
14) Separation check
15) Overall noise level check

1. IR Adjustment (AU-150 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9NS)
Measurement Point	Pins ㊹ and ⑥ of IC601 (1.5 MHz IR) Pins ㊹ and ⑥ of IC602 (1.7 MHz IR)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR), 7C (1.7 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
- 1.5 MHz IR adjustment
2) Connect the digital voltmeter to pin ㊹ of IC601, and read the voltage. (Approximately 2100 mVdc)
3) Connect the digital voltmeter to pin ⑥ of IC601.
4) Change the data of page: D, address: 7A, and adjust so that the voltage of pin ⑥ of IC601 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
5) Press the PAUSE button of the adjusting remote control unit.
- 1.7 MHz IR adjustment
6) Connect the digital voltmeter to pin ㊹ of IC602, and read the voltage. (Approximately 2100 mVdc)
7) Connect the digital voltmeter to pin ⑥ of IC602.
8) Change the data of page: D, address: 7C, and adjust so that the voltage of pin ⑥ of IC602 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
9) Press the PAUSE button of the adjusting remote control unit.

2. 1.5 MHz Carrier Frequency Check (AU-150 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC601
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

3. 1.7 MHz Carrier Frequency Check (AU-150 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC602
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.700 ± 0.002 MHz

Note: 1) Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.
2) Insert a shorting plug into the audio input terminal (right).

Checking method:

1) Check that the 1.7 MHz carrier frequency satisfies the specified value.

4. 1.5 MHz Record Level Check (AU-150 board)

Mode	Record (Monaural)
Signal	No signal
Measurement Point	Pin ㉛ of CN601 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	A=41 ± 5 mVp-p

Note: Remove the plug inserted into the audio output terminal (right), or connect the collector of Q605 and GND with a jumper wire.

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
   (Read the center of the luminance line width and note down the level read.)

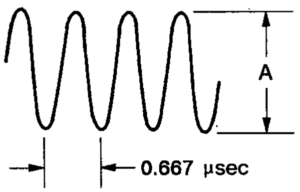


Fig. 9-23.

5. 1.7 MHz Record Level Check (AU-150 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ㉛ of CN601 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	$\frac{\text{1.7 MHz carrier level}}{\text{1.5 MHz carrier level}} = 0.80 \pm 0.12$

Note: Insert a shorting plug into the audio output terminal (right).

Connection:

1) Remove and check C690 (0.01 µF). After checking, connect a new capacitor.

Checking method:

1) Check that the level ratio of 1.5 MHz carrier and 1.7 MHz carrier satisfies the specified value.

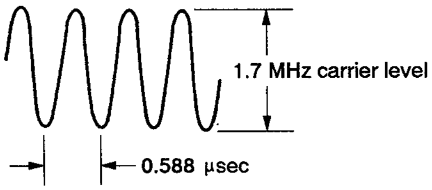


Fig. 9-24.

6. E-E Output Level Check (AU-150 board)

Mode	Record
Signal	400 Hz, –38 dBs Pin ② [Pin ④] of CN602
Measurement Point	Audio output terminal left [right]
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

7. REC Matrix L-R Adjustment (AU-150 board)

Mode	Record
Signal	400 Hz, –38 dBs Input to both Pin ② and Pin ④ of CN602
Measurement Point	Pin ③ of IC603
Measuring Instrument	Oscilloscope (Use 1:1 probe)
Adjustment Page	D
Adjustment Address	78 (L/R MX LEVEL (REC))
Specified Value	0 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 78, and minimize the 400 Hz signal level.
3) Press the PAUSE button of the adjusting remote control unit.

8. REC Matrix L+R Check (AU-150 board)

Mode	Record
Signal	1. 400 Hz, –38 dBs: Pin ② of CN602 (MIC L) No signal: Pin ④ of CN602 (MIC R) 2. No signal: Pin ② of CN602 (MIC L) 400 Hz, –38 dBs: Pin ④ of CN602 (MIC R)
Measurement Point	Pin ㉕ of IC603
Measuring Instrument	Oscilloscope
Specified Value	The level difference is 0 ± 10 mVp-p when only the left channel is input and when only the right channel is input.

Note: When measuring the signal level of pin ㉕ of IC603, wait for more than 1 minute after signal input before measuring. (To stabilize the AGC)

Adjusting method:

1) Input the 400 Hz, –38 dBs signal only to pin ② of CN602 (MIC L). (Connect pin ④ of CN602 (MIC R) and GND with a jumper wire.)
2) Read the 400 Hz signal level of pin ㉕ of IC603, and take it down. (Approximately 200 mVp-p)
3) Input the 400 Hz, –38 dBs signal only to pin ④ of CN602 (MIC R). (Connect pin ② of CN602 (MIC L) and GND with a jumper wire.)
4) Check that the 400 Hz signal level of pin ㉕ of IC603 (the value that was taken down at step 2) is ± 10 mVp-p.

9. 1.5 MHz Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal left or right
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

10. 1.7 MHz Deviation Adjustment (AU-150 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9NS) Bilingual (Monoscope) section
Measurement Point	1. Pin ㉘ of IC603 2. Pin ㊱ of IC603
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7D (1.7 DEV)
Specified Value	8 ± 0.05 graduation

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Connect the oscilloscope to pin ㉘ of IC603.
3) Adjust the 400 Hz signal amplitude to the 8.0 graduation using the VOLT/DIV knob of the oscilloscope.
4) Connect the oscilloscope to pin ㊱ of IC603.
5) Change the data of page: D, address: 7D, and adjust so that the 1 kHz signal level becomes 8 ± 0.05 graduation. (Adjust with the center of the luminance line width.)
6) Press the PAUSE button of the adjusting remote control unit.

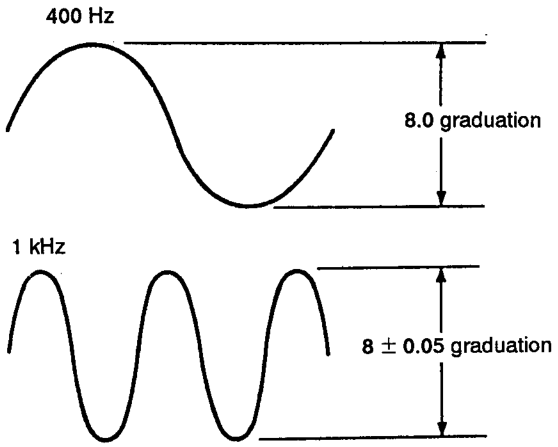


Fig. 9-25.

11. PB Matrix L Adjustment (AU-150 board)

Mode	Self recording/playback
Signal	No signal: Pin ② of CN602 (MIC L) 400 Hz, –38 dBs: Pin ④ of CN602 (MIC R)
Measurement Point	Audio output terminal left
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	79 (L/R MX LEVEL (PB))
Specified Value	Below 20 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Input the 400 Hz, –38 dBs signal only to pin ④ of CN602 (MIC R). (Connect pin ② of CN602 (MIC L) and GND with a jumper wire.)
3) Record.
4) Remove the input signal.
5) Playback the recorded section.
6) Change the data of page: D, address: 79, and minimize the cross talk component (400 Hz).
7) Press the PAUSE button of the adjusting remote control unit.

12. PB Matrix R Check (AU-150 board)

Mode	Self recording/playback
Signal	400 Hz, –38 dBs: Pin ② of CN602 (MIC L) No signal: Pin ④ of CN602 (MIC R)
Measurement Point	Audio output terminal right
Measuring Instrument	Oscilloscope
Specified Value	Below 30 mVp-p

Checking method:

1) Input the 400 Hz, –38 dBs signal only to pin ② of CN602 (MIC L). (Connect pin ④ of CN602 (MIC R) and GND with a jumper wire.)
2) Record.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the cross talk component (400 Hz) is below 30 mVp-p.

13. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –66.0 dBs: Ext mic terminal (left) [right] No signal: Ext mic terminal (right) [left]
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –8.5 ± 2 dBs Distortion rate: Below 0.8% (Note 2)

Note: 1) The [ ] indicates the measuring point during the right channel check
2) Value when the following filter is used

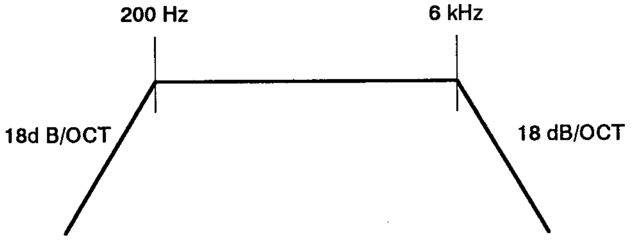


Fig. 9-26.

Checking method:

1) Input the 400 Hz, –66.0 dBs signal only to the Ext mic terminal (left) [right].
   Note: Connect the Ext mic terminal (right) [left] and GND with a jumper wire.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal (left) [right] is –8.5 ± 2 dBs, and that the distortion rate is below 0.8% (Note 2).

14. Separation Check

Mode	Self recording /playback
Signal	No signal: Ext mic terminal (left) [right] 1 kHz, –66.0 dBs: Ext mic terminal (right) [left]
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter (Use an IHF-A curve audio correction filter)
Specified Value	Below –27.5 dBs

Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

1) Connect the Ext mic terminal (left) [right] and GND with a jumper wire, and input a 1kHz, –66.0 dBs signal only to the Ext mic terminal (right) [left].
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the cross talk level (1 kHz) of the audio output terminal (left) [right] is below –27.5 dBs.

15. Overall Noise Level Check

Mode	Self recording
Signal	No signal: Ext mic terminal left and right
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –62.5 dBs

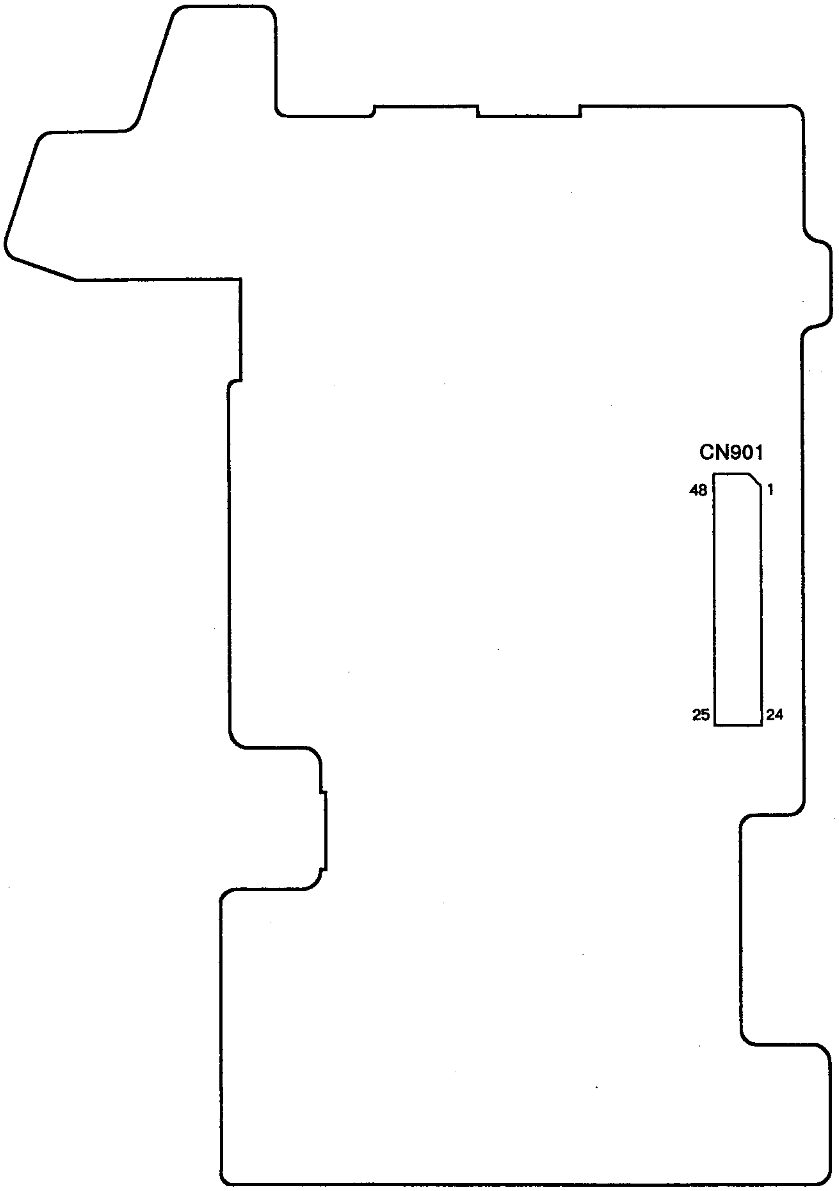
Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

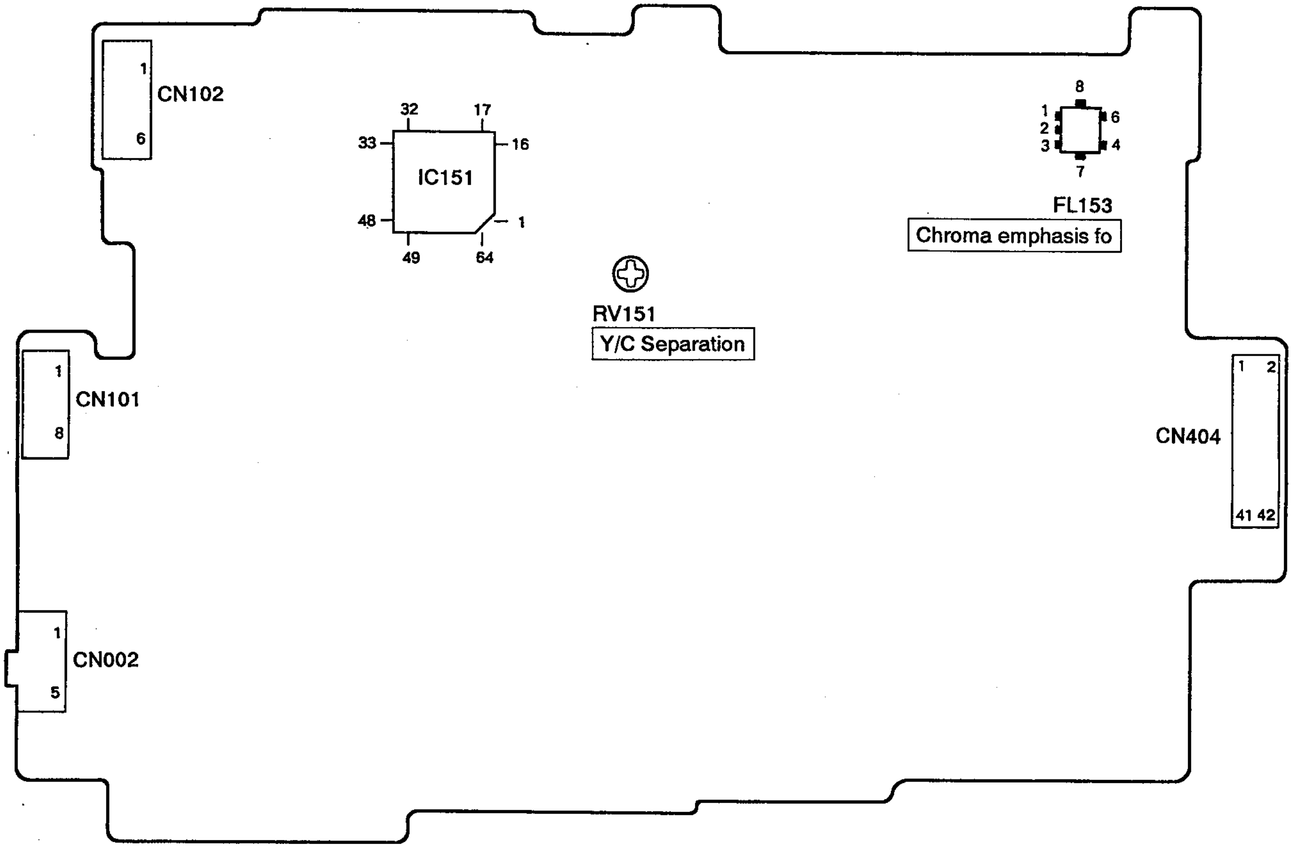
1) Connect the Ext mic terminal left and GND with a jumper wire, and connect the terminal right and GND with a jumper wire
2) Record.
3) Remove the jumper wire.
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal (left) [right] is below –62.5 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

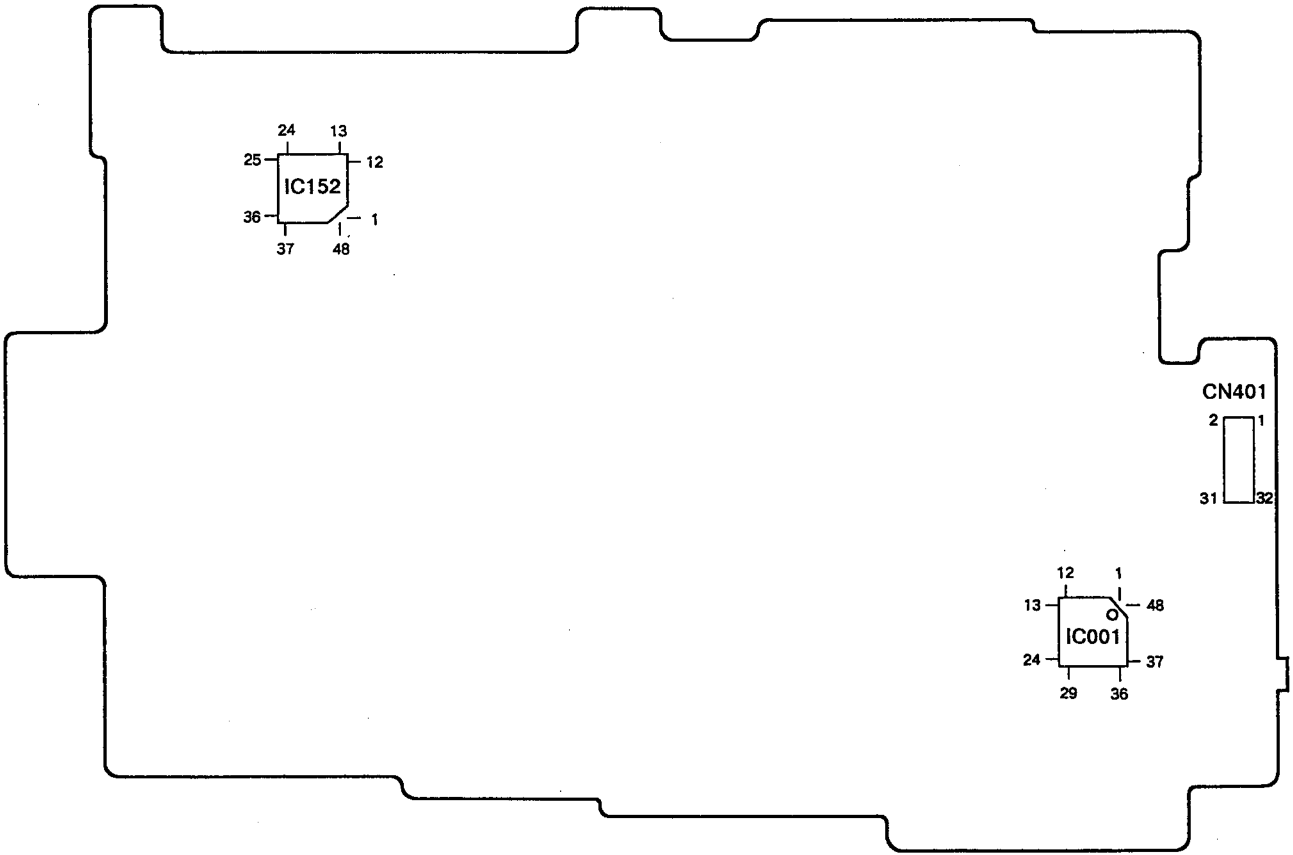
DD-56 BOARD (COMPONENT SIDE)


CN901
48
1
25
24

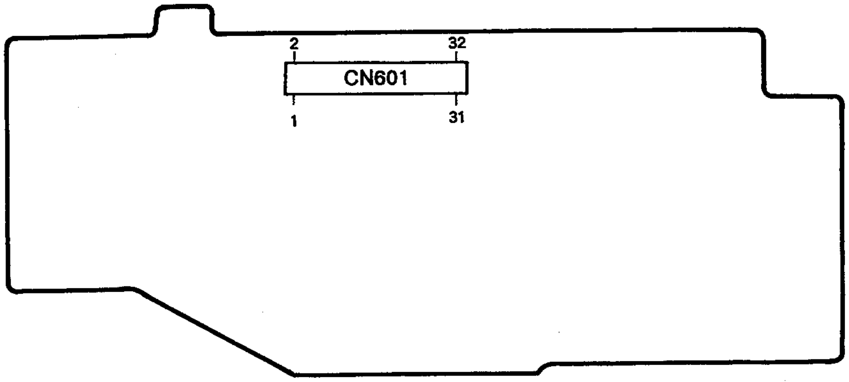
VS-100 BOARD (COMPONENT SIDE)


CN102
1
6
IC151
32
17
33
16
48
1
49
64
8
1
2
3
6
4
7
FL153
Chroma emphasis fo
RV151
Y/C Separation
CN101
1
8
CN404
1
2
41
42
CN002
1
5

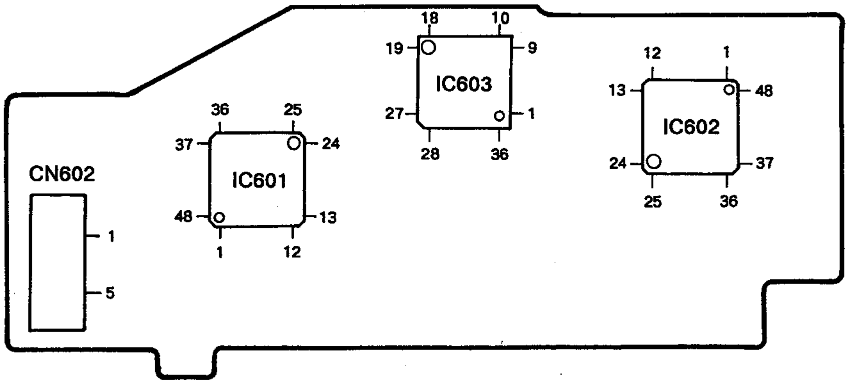
VS-100 BOARD (CONDUCTOR SIDE)


IC152
24
13
25
12
36
1
37
48
CN401
2
1
31
32
IC001
12
1
13
48
24
37
29
36

AU-150 BOARD (COMPONENT SIDE)


2
32
CN601
1
31

AU-150 BOARD (CONDUCTOR SIDE)


18
10
19
9
IC603
27
1
28
36
12
1
13
48
IC602
24
37
25
36
36
25
37
24
CN602
IC601
48
13
1
12
1
5

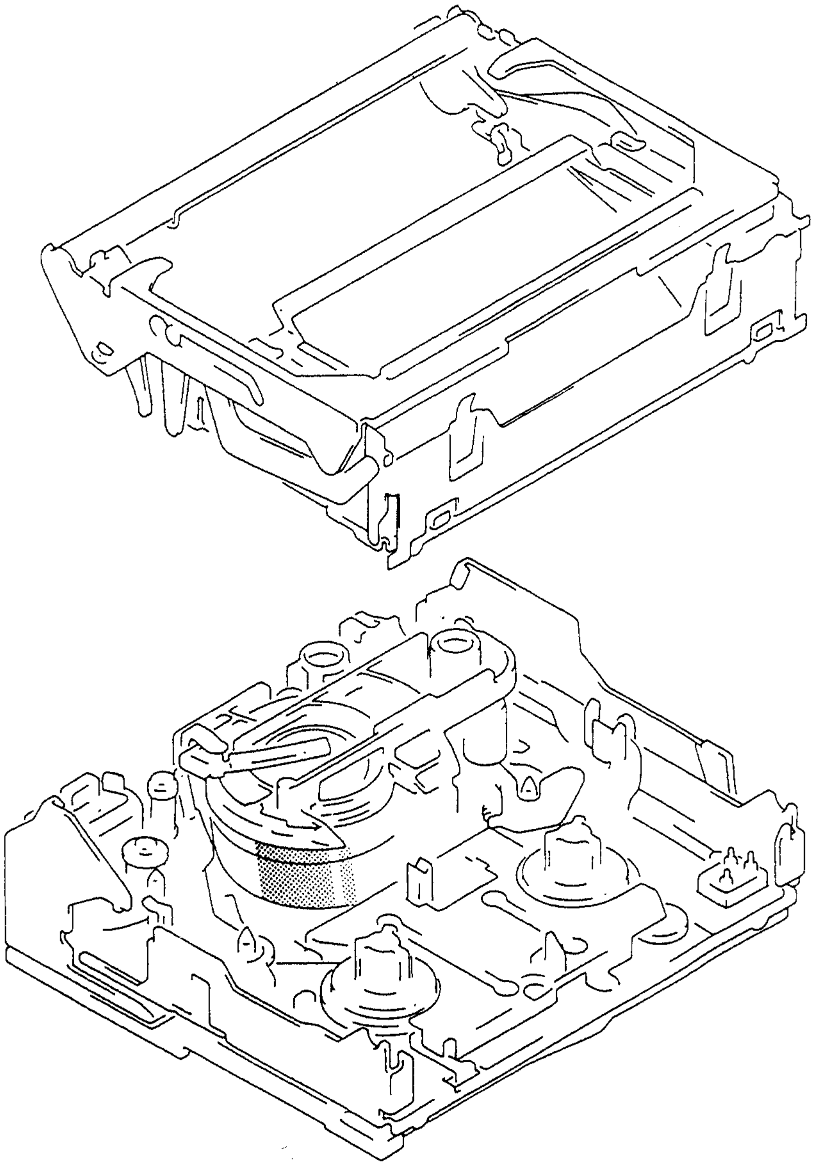
8 mm Video MECHANICAL ADJUSTMENT MANUAL IV

V12995

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the USE mode.
2) Push the part ⓐ of lock arm **1** toward the arrow 🅐 to unlock from lock guide **2**, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws **3** and remove the LS frame **4** toward the arrow 🅑.
4) With the cassette compartment assembly **5** pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively.
   In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly **5** in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

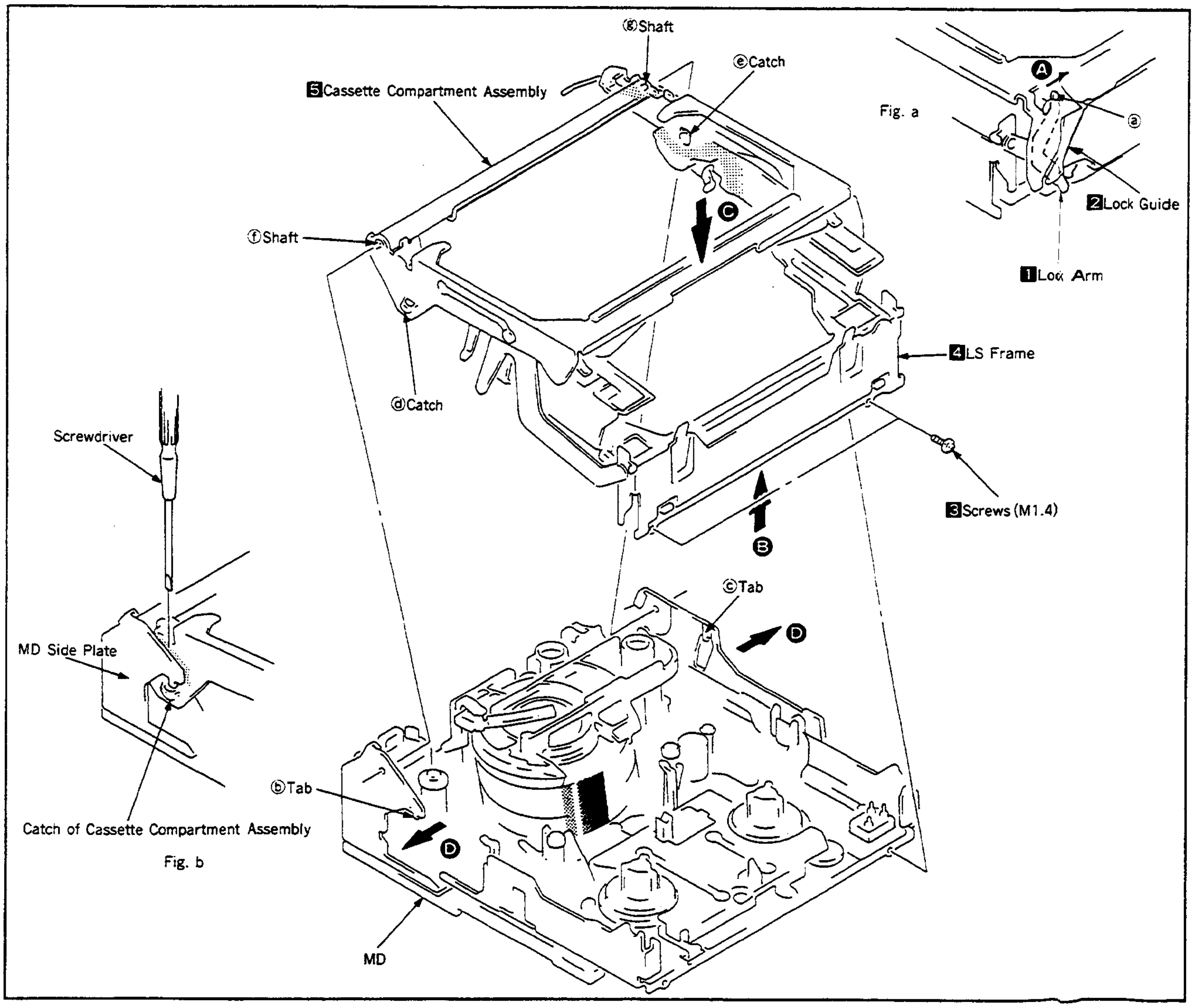

ⓖShaft
ⓔCatch
5Cassette Compartment Assembly
Fig. a
A
ⓐ
2Lock Guide
1Lock Arm
ⓕShaft
C
4LS Frame
ⓓCatch
Screwdriver
3Screws (M1.4)
B
ⓒTab
D
MD Side Plate
ⓑTab
Catch of Cassette Compartment Assembly
Fig. b
D
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder 6 of cassette compartment assembly 5 toward the arrow 🅔, and lower the LS frame 4 toward the arrow 🅕.
3) With the cassette compartment assembly 5 tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.
   At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly 5 so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm 1 of cassette compartment assembly must be inserted into a groove in the guide rail 7 on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame 4 inside the LS chassis 8.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws 3.

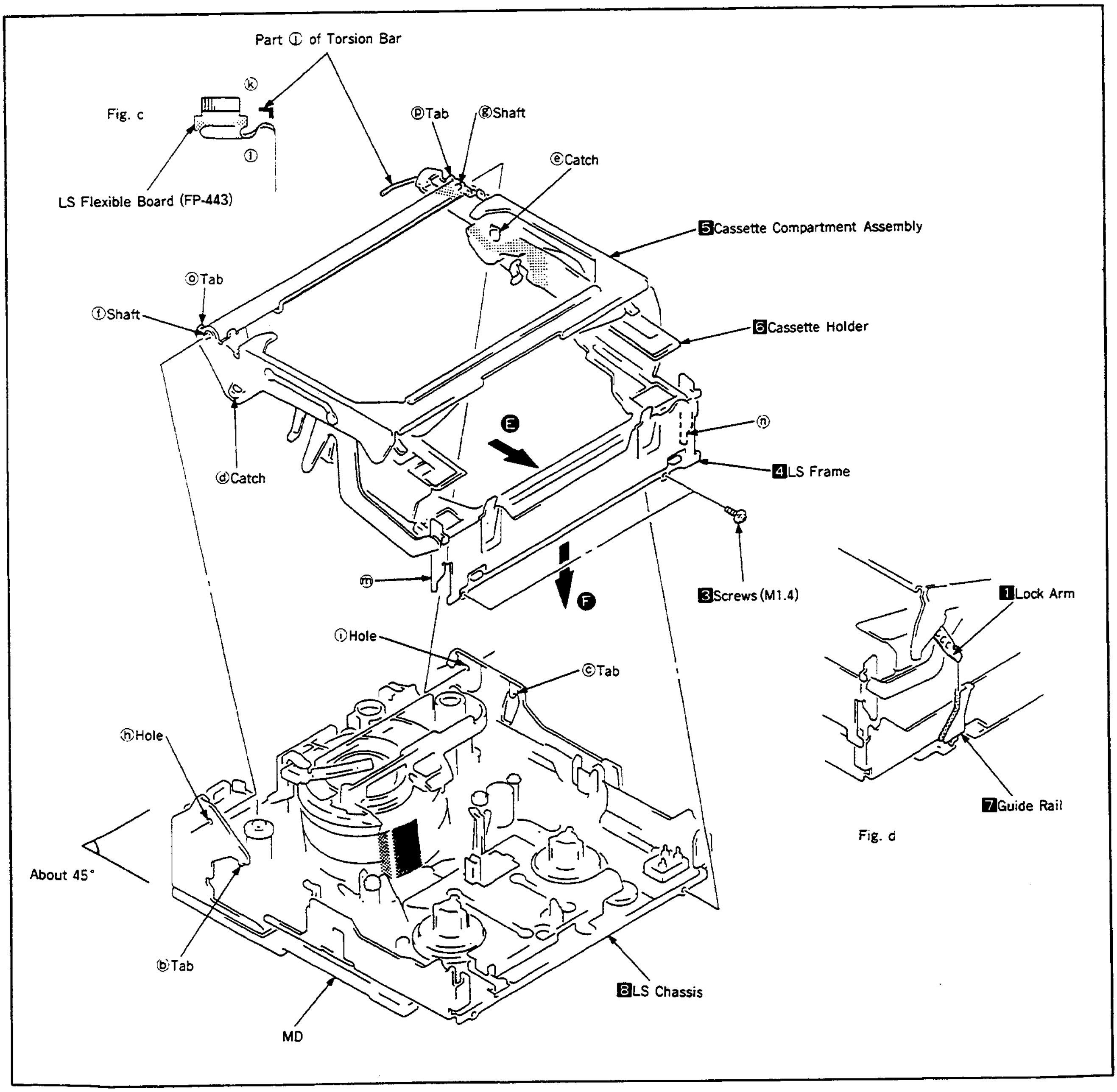

Part ⓙ of Torsion Bar
Fig. c
ⓚ
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
5Cassette Compartment Assembly
ⓞTab
ⓕShaft
6Cassette Holder
🅔
ⓝ
ⓓCatch
4LS Frame
ⓜ
🅕
3Screws (M1.4)
1Lock Arm
ⓘHole
ⓒTab
ⓗHole
About 45°
7Guide Rail
Fig. d
ⓑTab
8LS Chassis
MD

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap ❷ on the Reflector C ❶.
3) Press the pin of the push switch ❸ (ON state) and fix it with adhesive tape ❹ in that state.

Note : Press the asterisked (∗) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch ❺ in an arrow direction as shown in Fig. a.

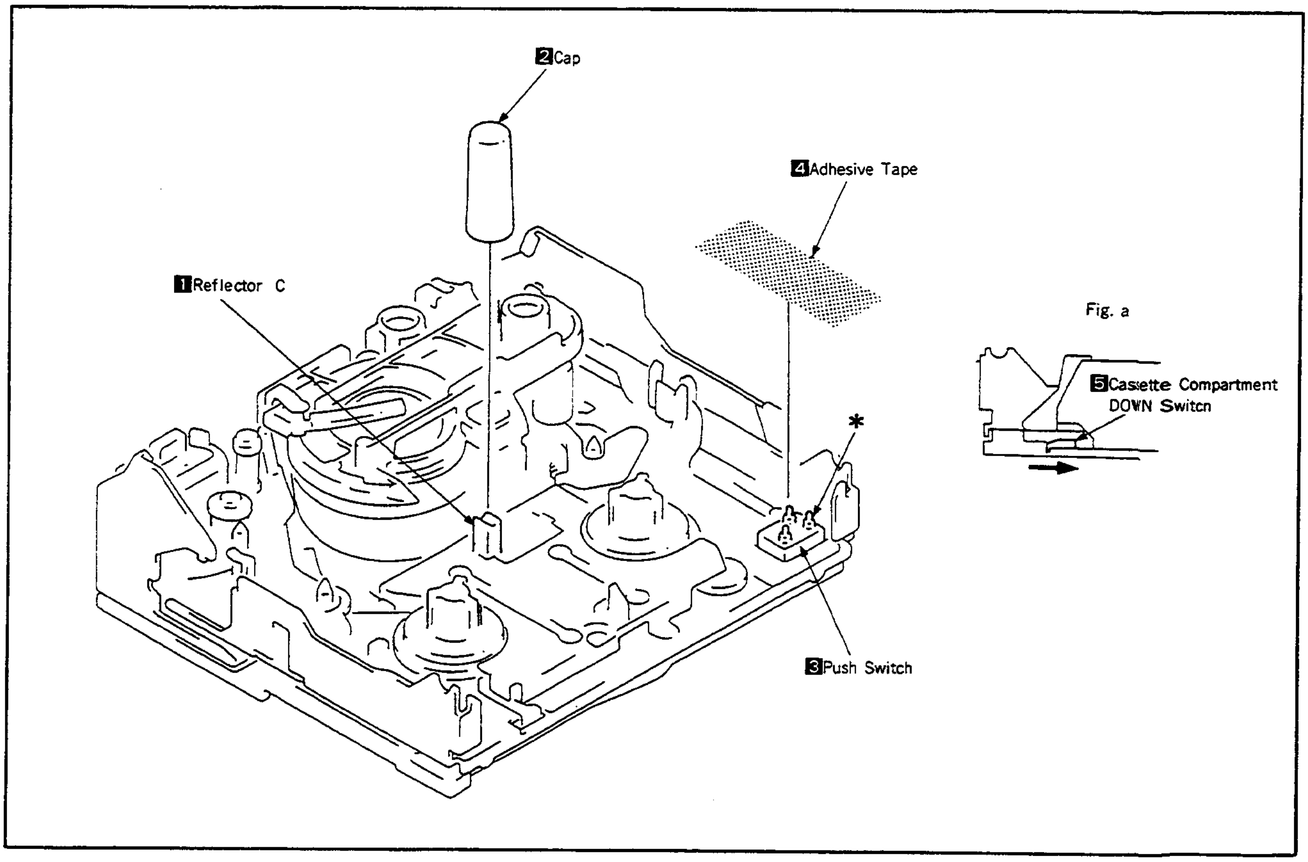

❷Cap
❹Adhesive Tape
❶Reflector C
∗
❸Push Switch
Fig. a
❺Cassette Compartment DOWN Switch

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector. U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

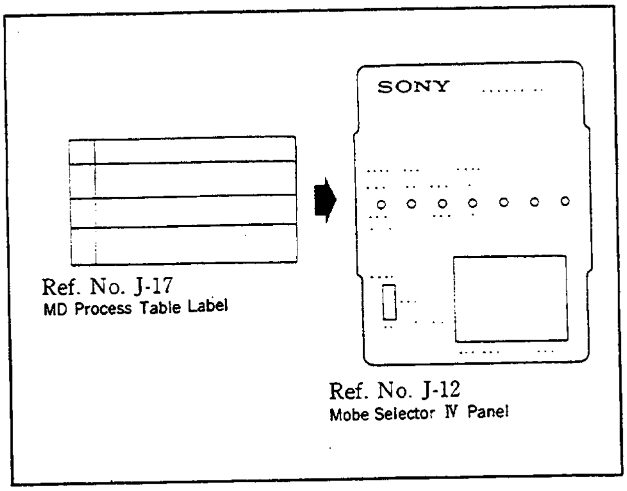

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector Ⅳ Panel

Fig. 4

1 Construction (Fig.5)

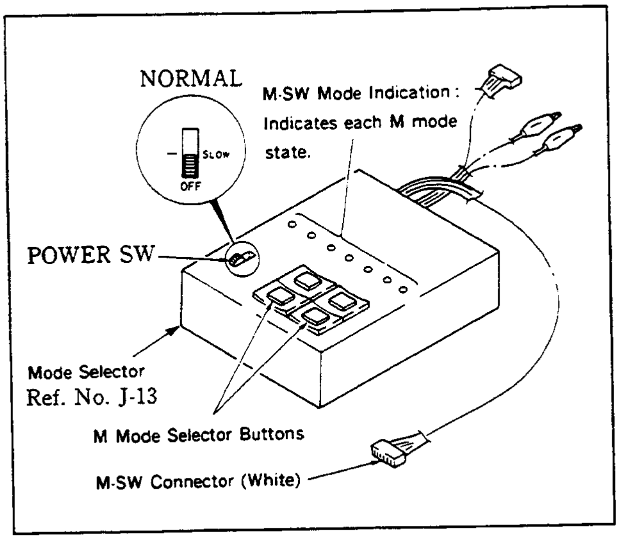

NORMAL
SLOW
OFF
M-SW Mode Indication :
Indicates each M mode
state.
POWER SW
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector **1** and M-SW connector **2** into the mode selector IV conversion connector **3** respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

For CCD-FX410 series

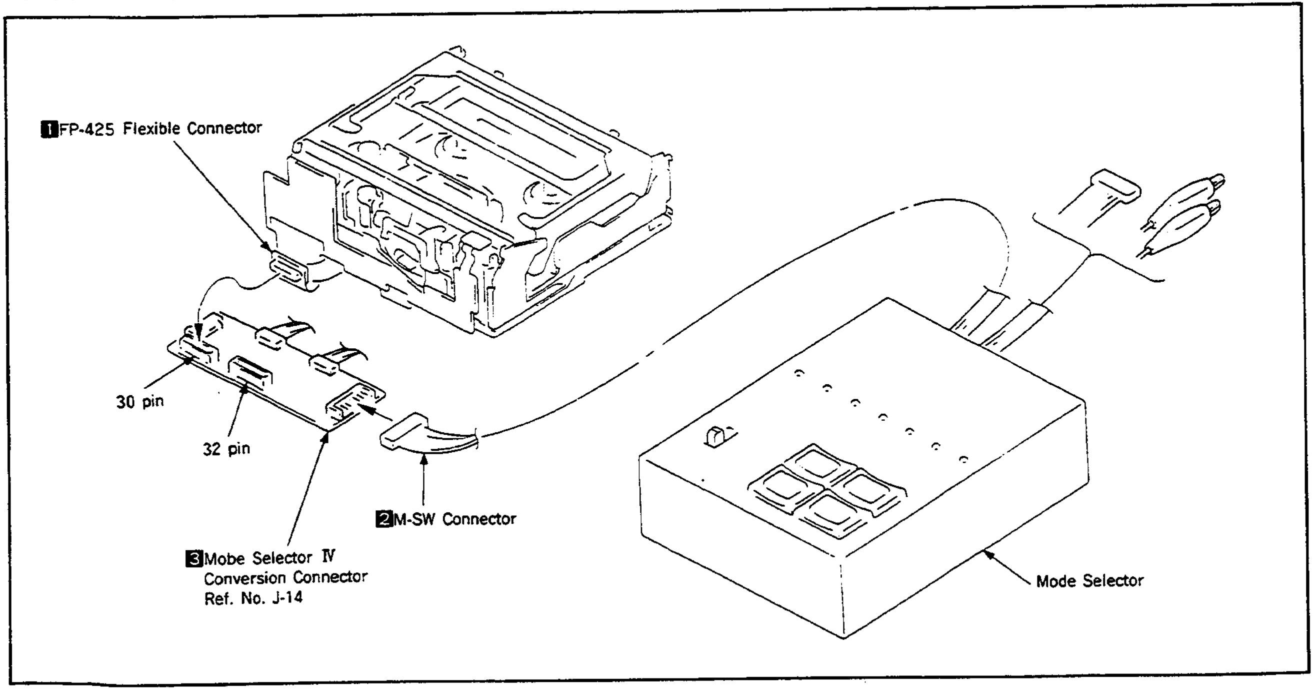
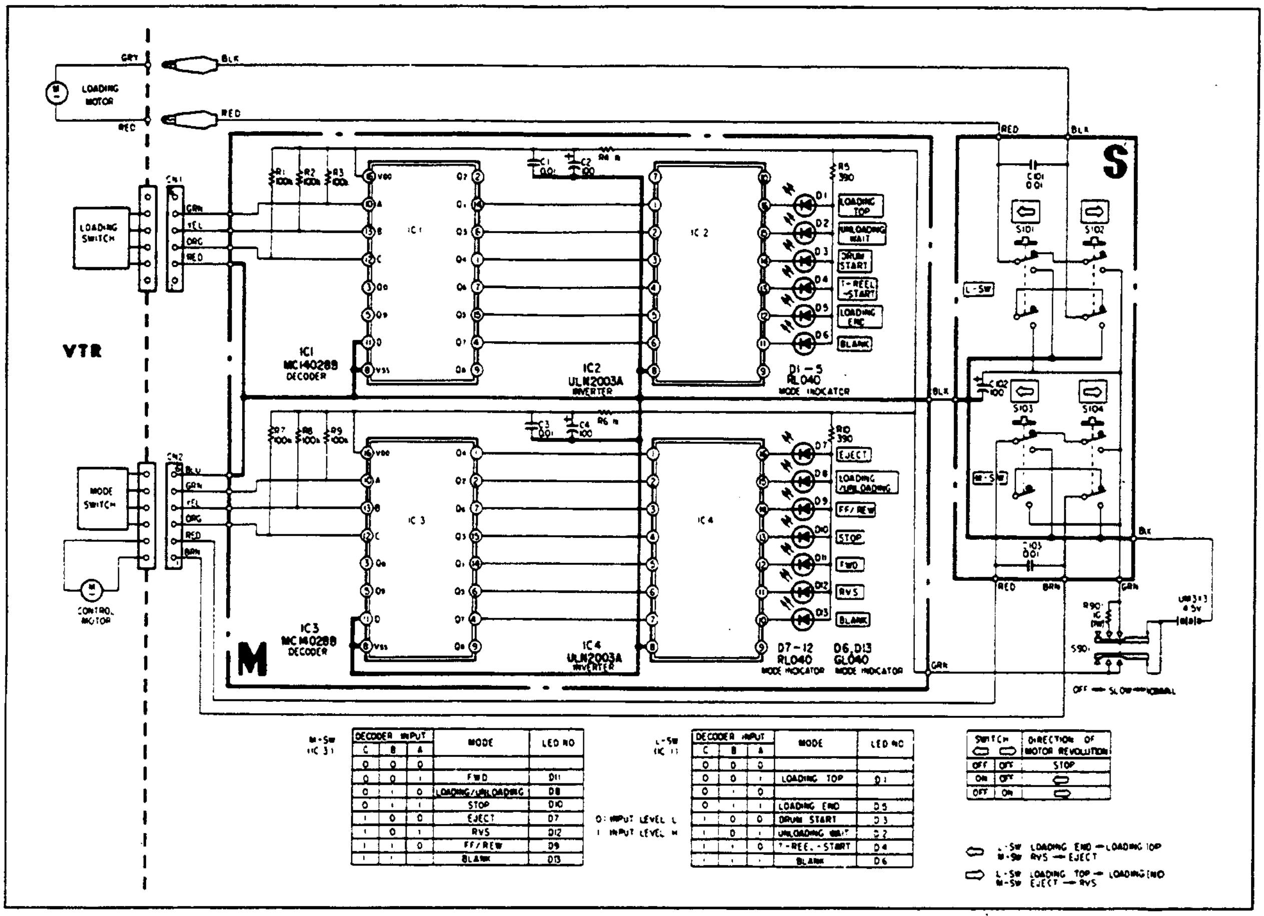

1 FP-425 Flexible Connector
30 pin
32 pin
2 M-SW Connector
3 Mobe Selector Ⅳ
Conversion Connector
Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


LOADING MOTOR
GRY
BLK
RED
LOADING SWITCH
MODE SWITCH
CONTROL MOTOR
VTR
CN1
CN2
GRN
YEL
ORG
RED
BLU
BRN
IC1
MC14028B
DECODER
IC2
ULN2003A
INVERTER
IC3
MC14028B
DECODER
IC4
ULN2003A
INVERTER
D1~5
RL040
MODE INDICATOR
D7~12
RL040
MODE INDICATOR
D6,D13
GL040
MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL -START
LOADING END
BLANK
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
S
M
S101
S102
S103
S104
L-SW
M-SW
C101 0.01
C102 100
C103 0.01
R5 390
R10 390
S901
R901
OFF → SLOW → NORMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL -START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-5. MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description		
		CAPACITOR		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V
		DIODE		
D1	8-719-812-31	DIODE TLR123		
D2	8-719-812-31	DIODE TLR123		
D3	8-719-812-31	DIODE TLR123		
D4	8-719-812-31	DIODE TLR123		
D5	8-719-812-31	DIODE TLR123		
D6	8-719-812-33	DIODE TLG123A		
D7	8-719-812-31	DIODE TLR123		
D8	8-719-812-31	DIODE TLR123		
D9	8-719-812-31	DIODE TLR123		
D10	8-719-812-31	DIODE TLR123		
D11	8-719-812-31	DIODE TLR123		
D12	8-719-812-31	DIODE TLR123		
D13	8-719-812-33	DIODE TLG123A		

Ref. No	Part No.	Description		
		IC		
IC1	8-752-240-28	IC TC4028BP		
IC2	8-752-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

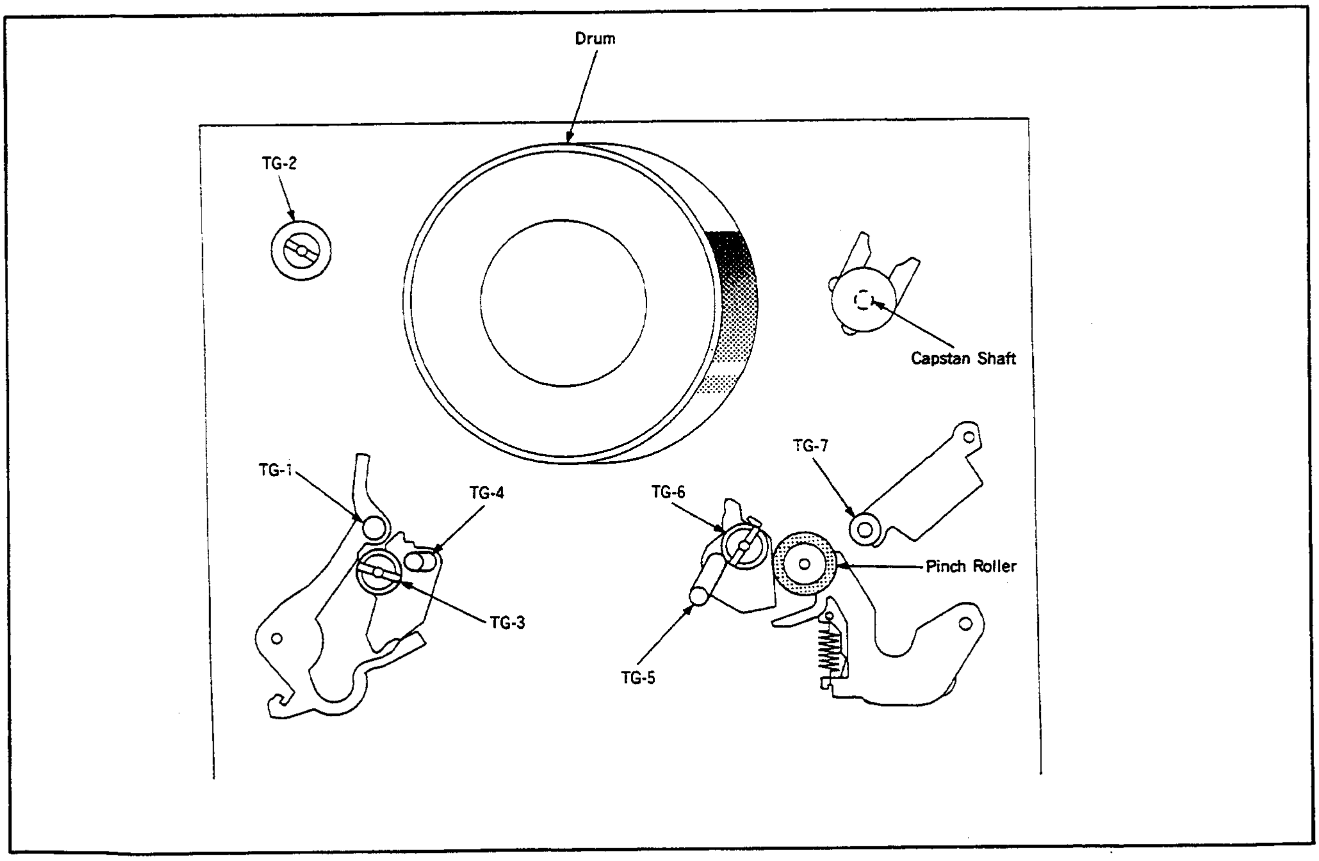


Fig. 7

2-3. PERILDIC CHECK ITEMS

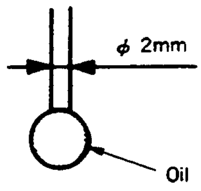
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

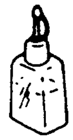


2-4. Service jigs list

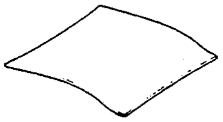
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅳ panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅳ conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment
- Oscilloscope
- Analog tester (20 kΩ)

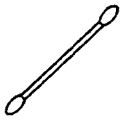
J-1



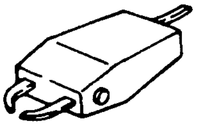
J-2



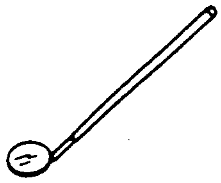
J-3



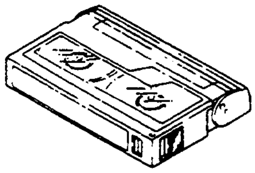
J-4



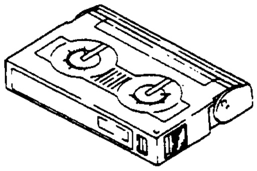
J-5



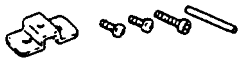
J-6



J-9

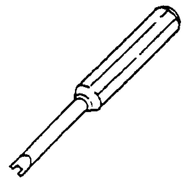


J-10

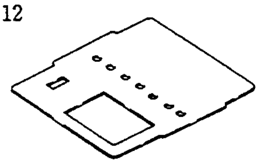


(Attached to the maintenance rotary upper drum)

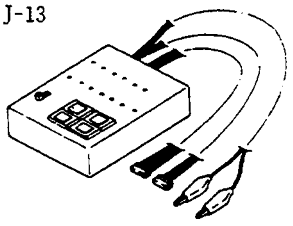
J-11



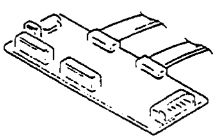
J-12



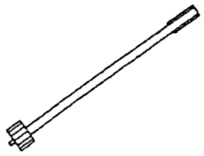
J-13



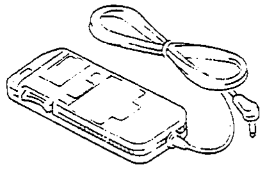
J-14



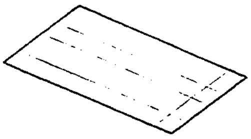
J-15



J-16



J-17



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw ❶.
3) Remove the Retainer, Gooseneck assembly ❷.

2. Mounting

1) Mount the Retainer, Gooseneck assembly ❷ with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

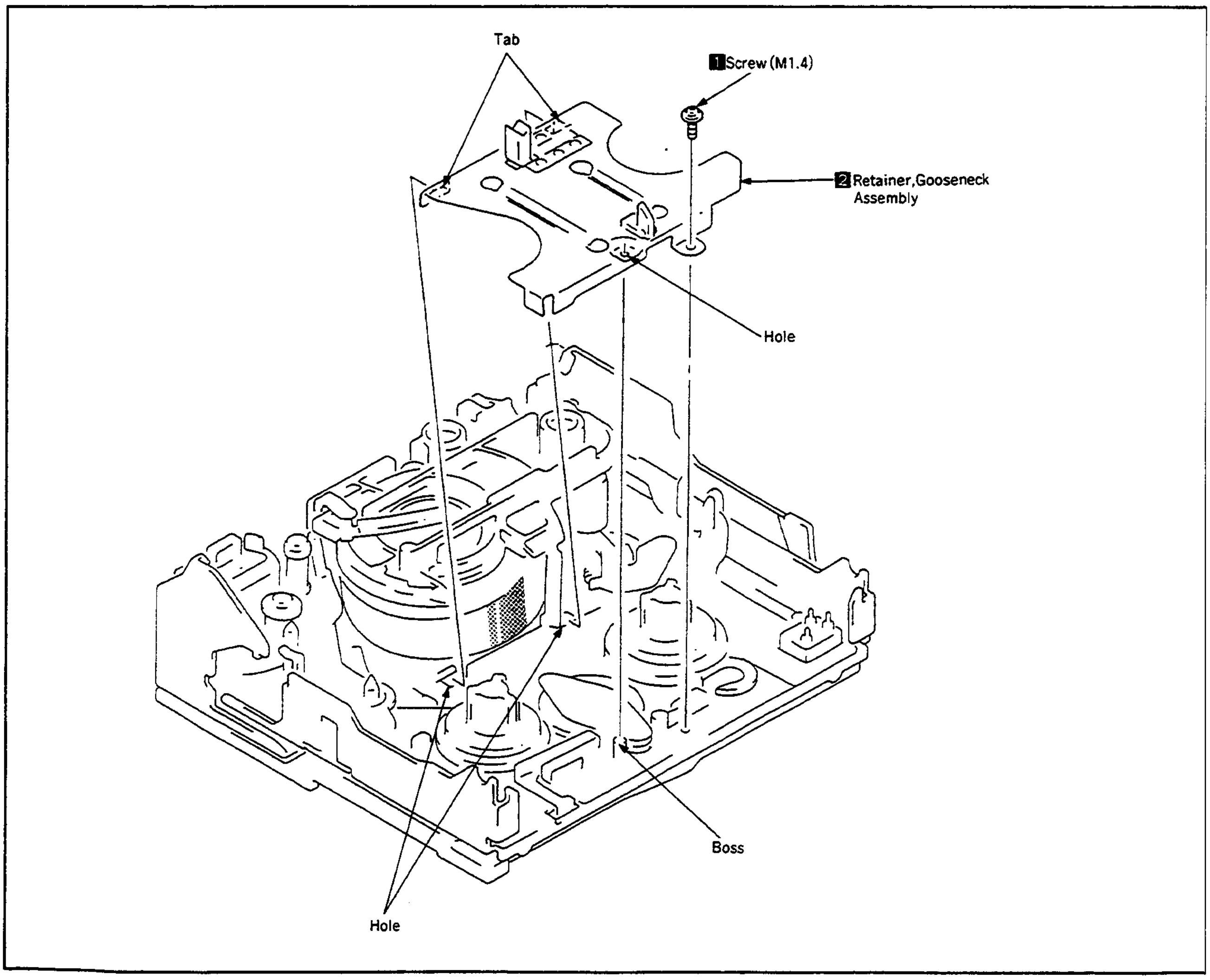


Fig. 8

3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws ❶, then the protector base assembly ❷.

2. Mounting

1) Mount the protector base assembly ❷ with its three hole engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder ❸.
2) Tighten two screws ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

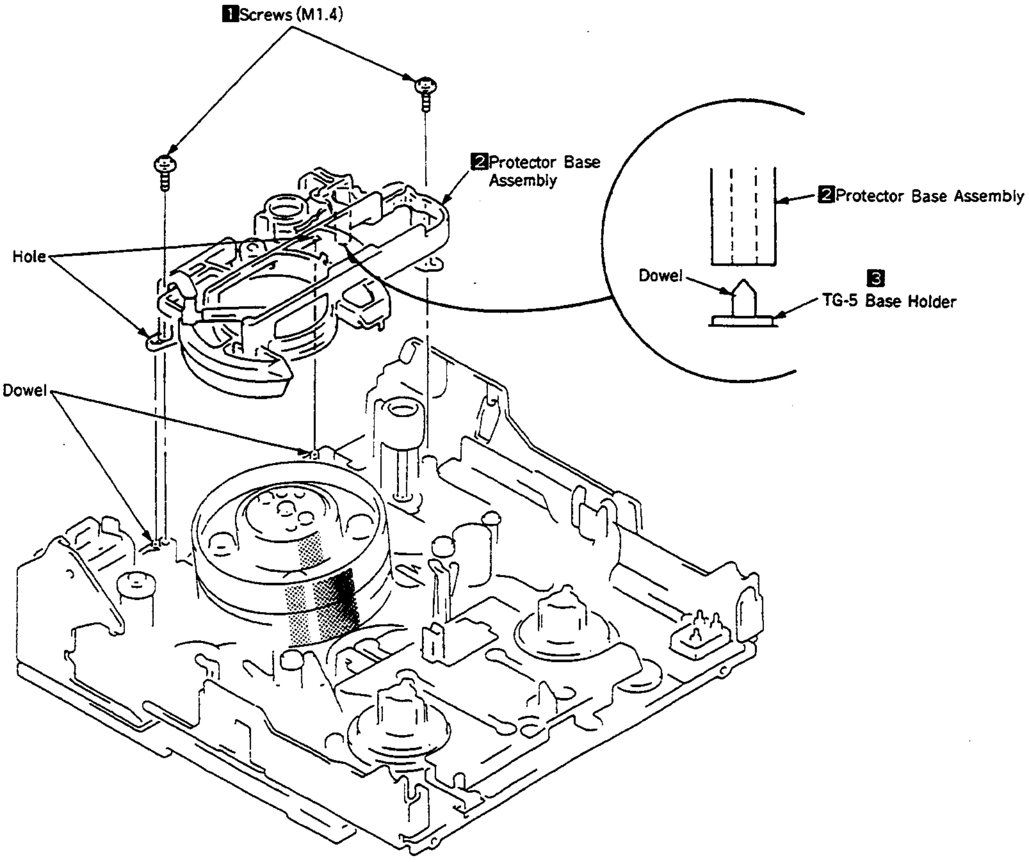

❶Screws (M1.4)
❷Protector Base Assembly
Hole
Dowel
❷Protector Base Assembly
Dowel
❸
TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board ❶ on the back of MD.
4) Remove three screw ❷, then the drum assembly ❸.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2. Mounting

1) Mount the drum assembly ❸ while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2) Tighten three screw assemblies ❷ in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board ❶ on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

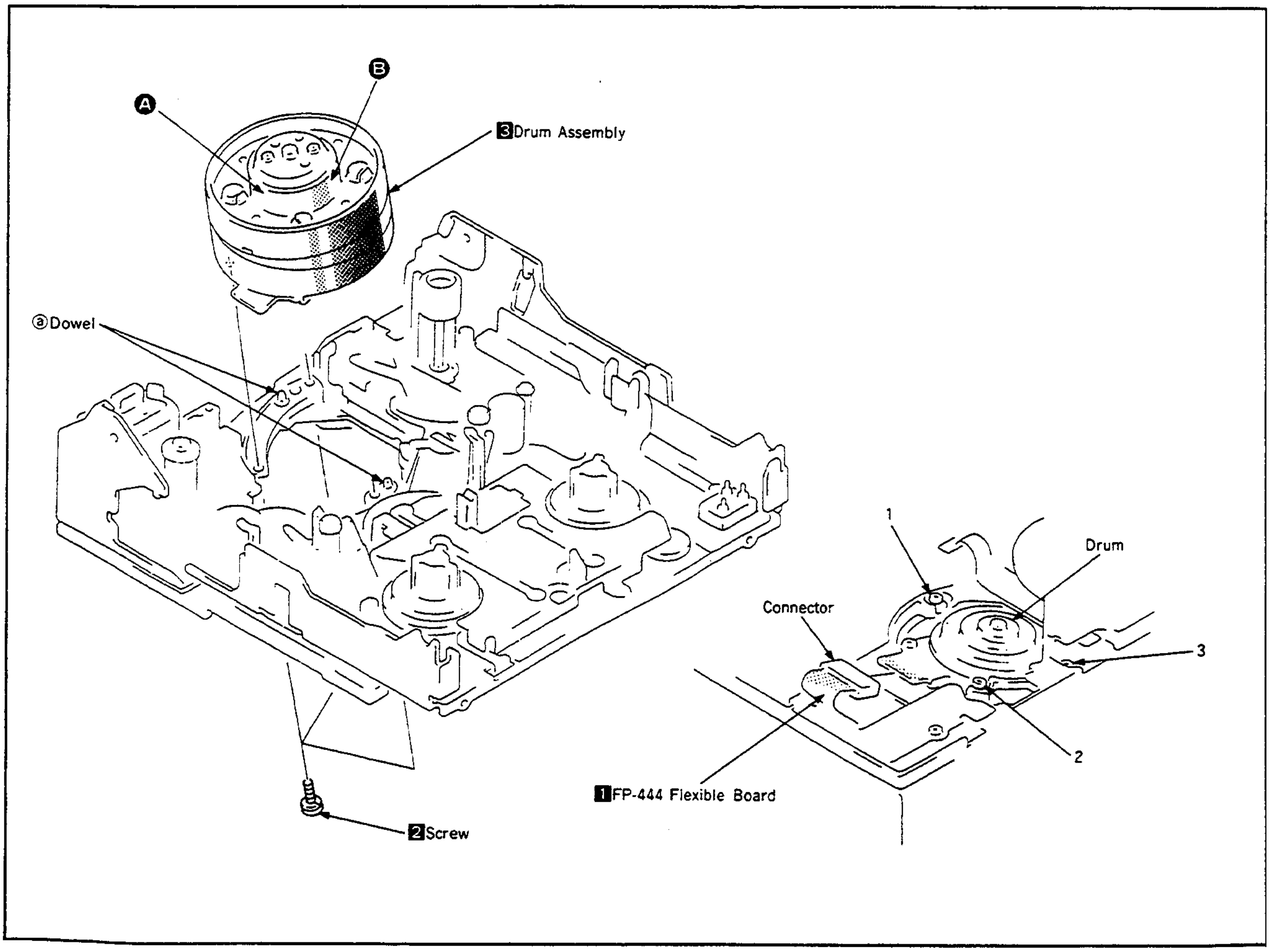


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw 1, then the capstan cover 2.
3) Remove the screw 3, then the capstan motor assembly 4.

2. Mounting

1) Mount the capstan motor assembly 4 and tighten the scre 3.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover 2 and tighten two screws 1.
3) Referring to 1-1, mount the cassette compartment assembly.

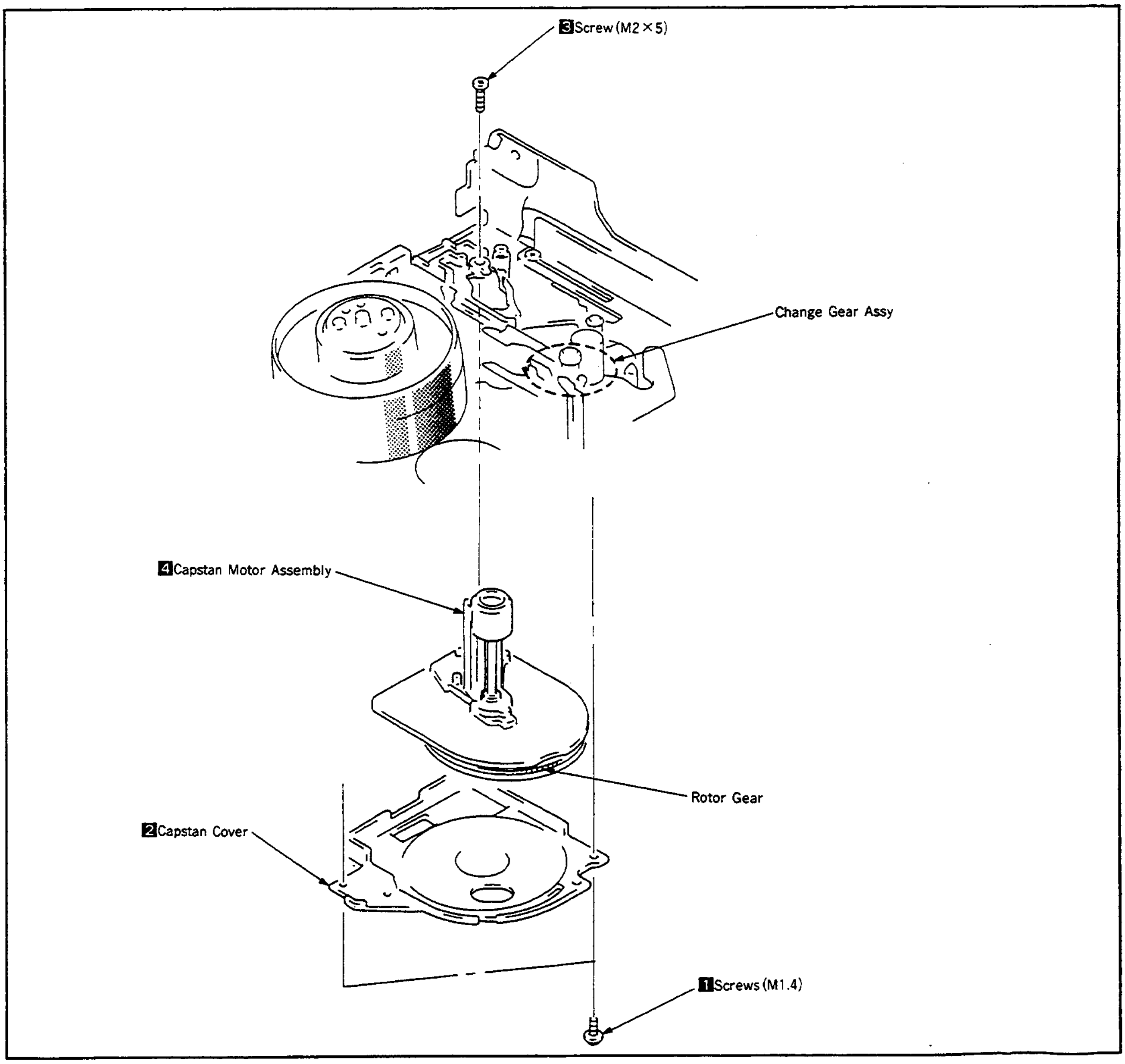

3 Screw (M2 × 5)
Change Gear Assy
4 Capstan Motor Assembly
Rotor Gear
2 Capstan Cover
1 Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly **1**.
4) Remove the T soft assembly **2**, then the T soft arm **3**.

2. Mounting

1) Mount the T soft arm **3** with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly **2** with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly **1** and rotate it toward the arrow Ⓐ to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

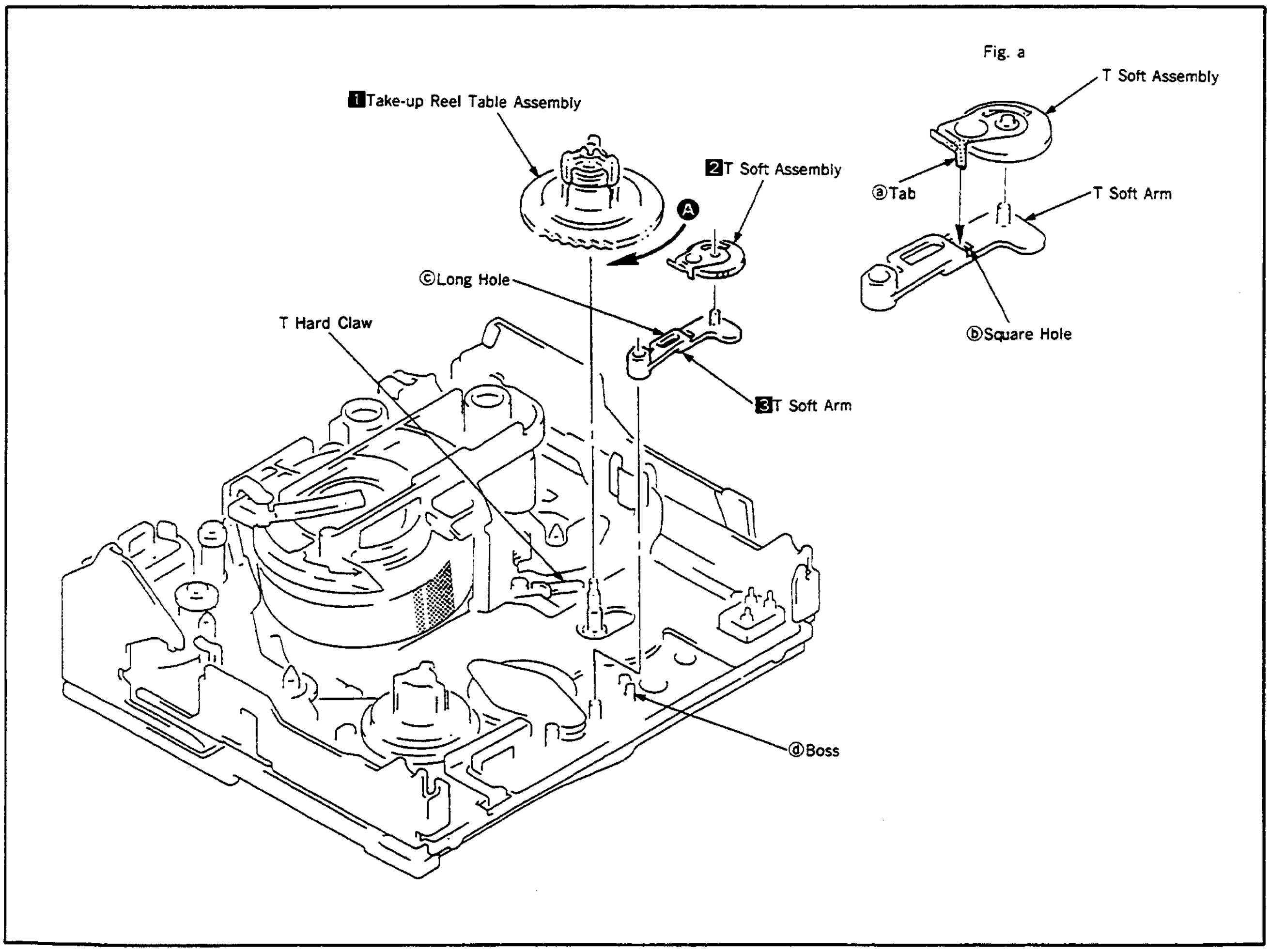


Fig. a
T Soft Assembly
ⓐTab
T Soft Arm
ⓑSquare Hole
1Take-up Reel Table Assembly
2T Soft Assembly
Ⓐ
ⓒLong Hole
T Hard Claw
3T Soft Arm
ⓓBoss

Fig. 12

3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the READY mode.
3) Remove a washer ❶, then the pinch arm assembly ❷.

2. Mounting

1) Select the READY mode.
2) Hooking a spring of pinch arm assembly ❷ to the casse positioning boss on the chassis, mount the pinch arm asser bly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss as shown in Fig. b.
4) Mount the washer ❶.
5) Referring to 1-1, mount the cassette compartment assembly.

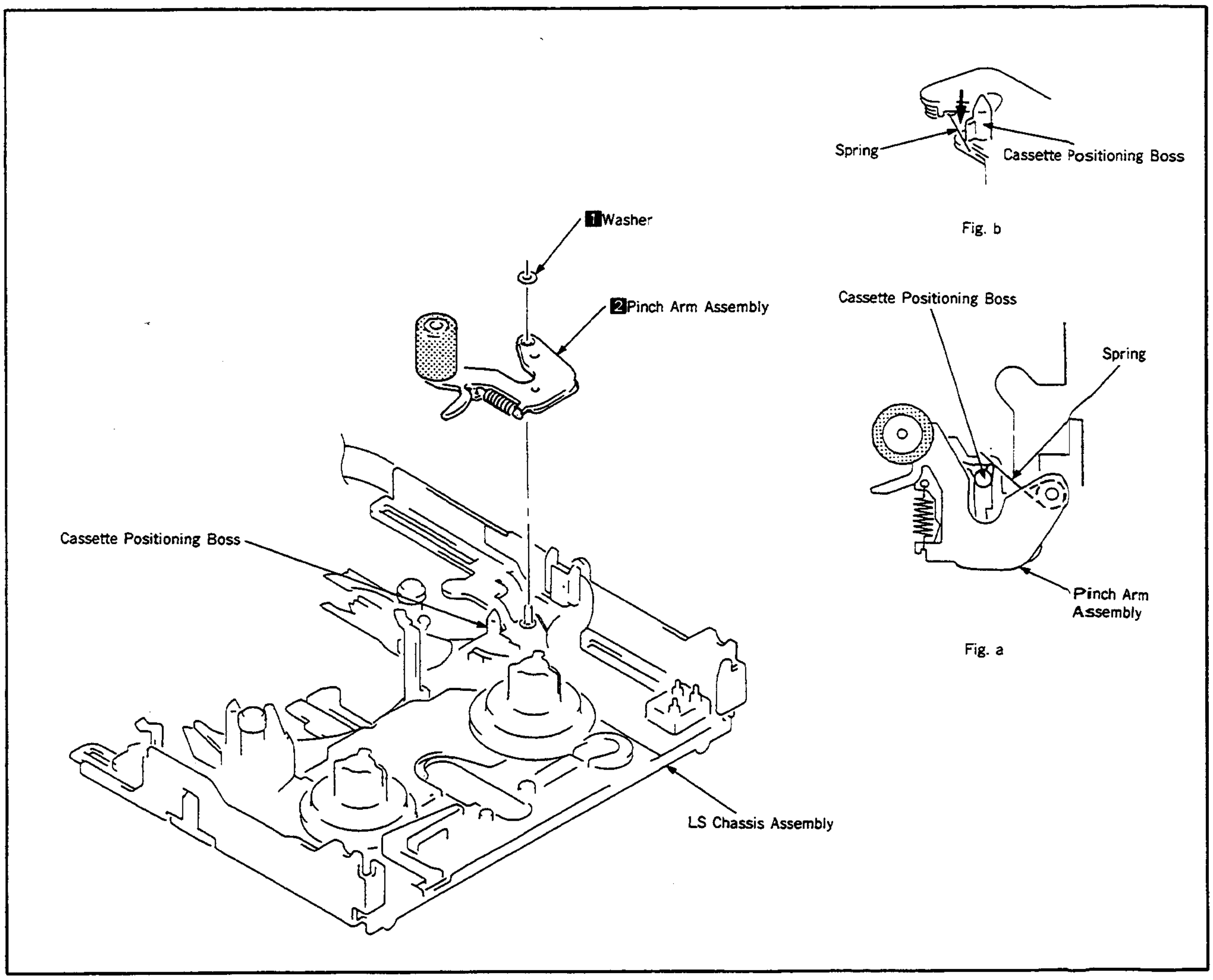

Spring
Cassette Positioning Boss
❶Washer
❷Pinch Arm Assembly
Cassette Positioning Boss
Spring
Cassette Positioning Boss
Pinch Arm Assembly
LS Chassis Assembly

Fig. b

Fig. a

Fig. 13

LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw ❶, TG-5 base holder ❷, and LS flexible board ❸.
5) Remove a lock washer ❹, then the gooseneck as sembly ❺.
6) Remove four screws ❻, then the LS chassis assembly ❼.

2. Mounting

1) Select the USE mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly ❼ on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws ❻.
6) Mount the LS flexible board ❸ and TG-5 base holder ❷,then tighten the screw ❶.
7) Mount the Gooseneck assembly ❺ and fix it with a washer ❹.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.

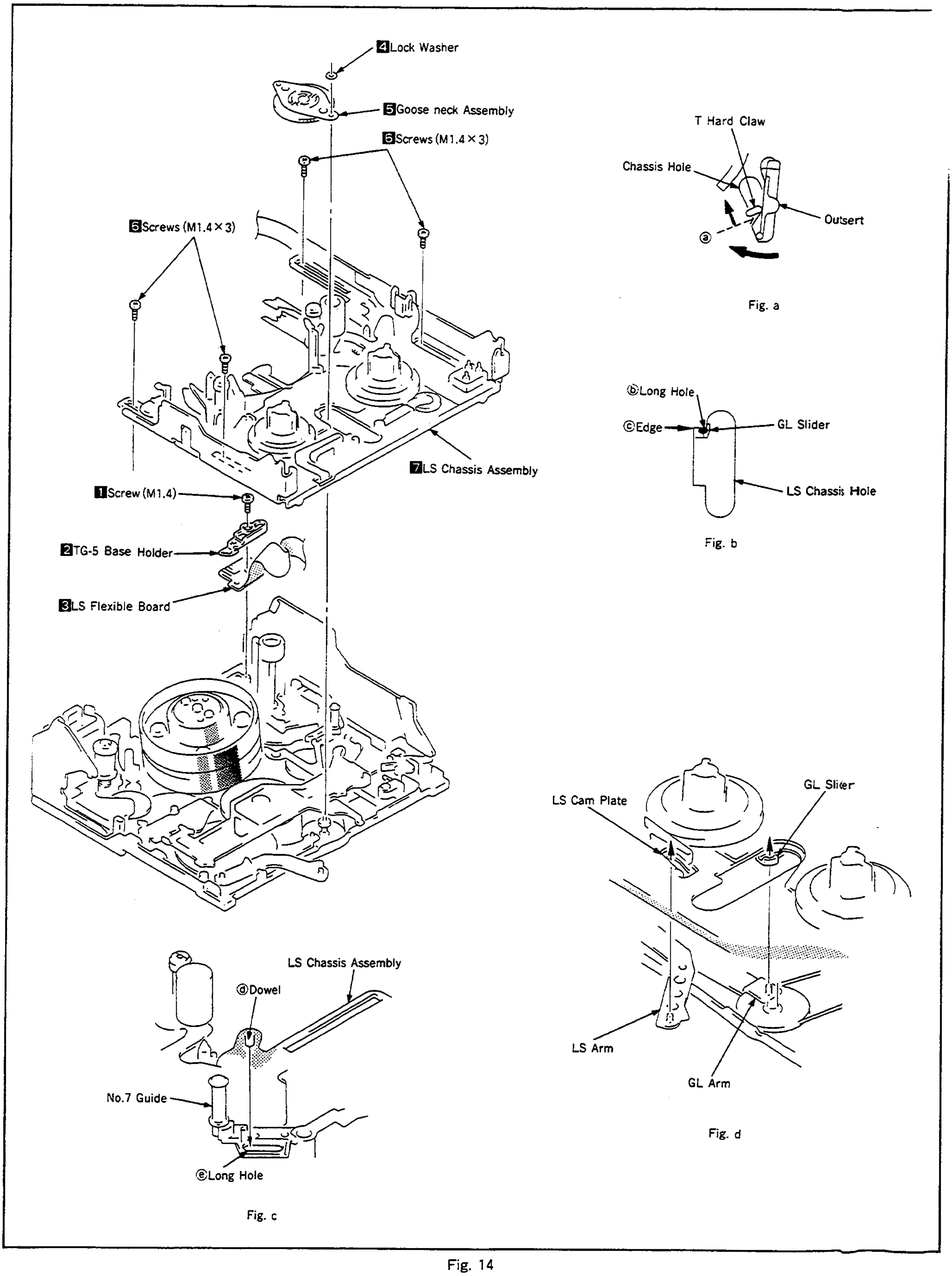

4 Lock Washer
5 Goose neck Assembly
6 Screws (M1.4×3)
6 Screws (M1.4×3)
7 LS Chassis Assembly
1 Screw (M1.4)
2 TG-5 Base Holder
3 LS Flexible Board
T Hard Claw
Chassis Hole
Outsert
ⓐ
ⓑ Long Hole
ⓒ Edge
GL Slider
LS Chassis Hole
LS Chassis Assembly
ⓓ Dowel
No.7 Guide
ⓔ Long Hole
LS Cam Plate
GL Slider
LS Arm
GL Arm

Fig. a

Fig. b

Fig. c

Fig. d

Fig. 14

3- GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider ❶ toward the arrow Ⓐ, and remove the guide base T assembly ❷ and guide base S assembly ❸ from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly ❹, guide arm S assembly ❺ and GL slider ❶ from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly ❷ and guide base S assembly ❸ with the respective guide rails, push in the GL slider ❶ toward the arrow Ⓑ as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

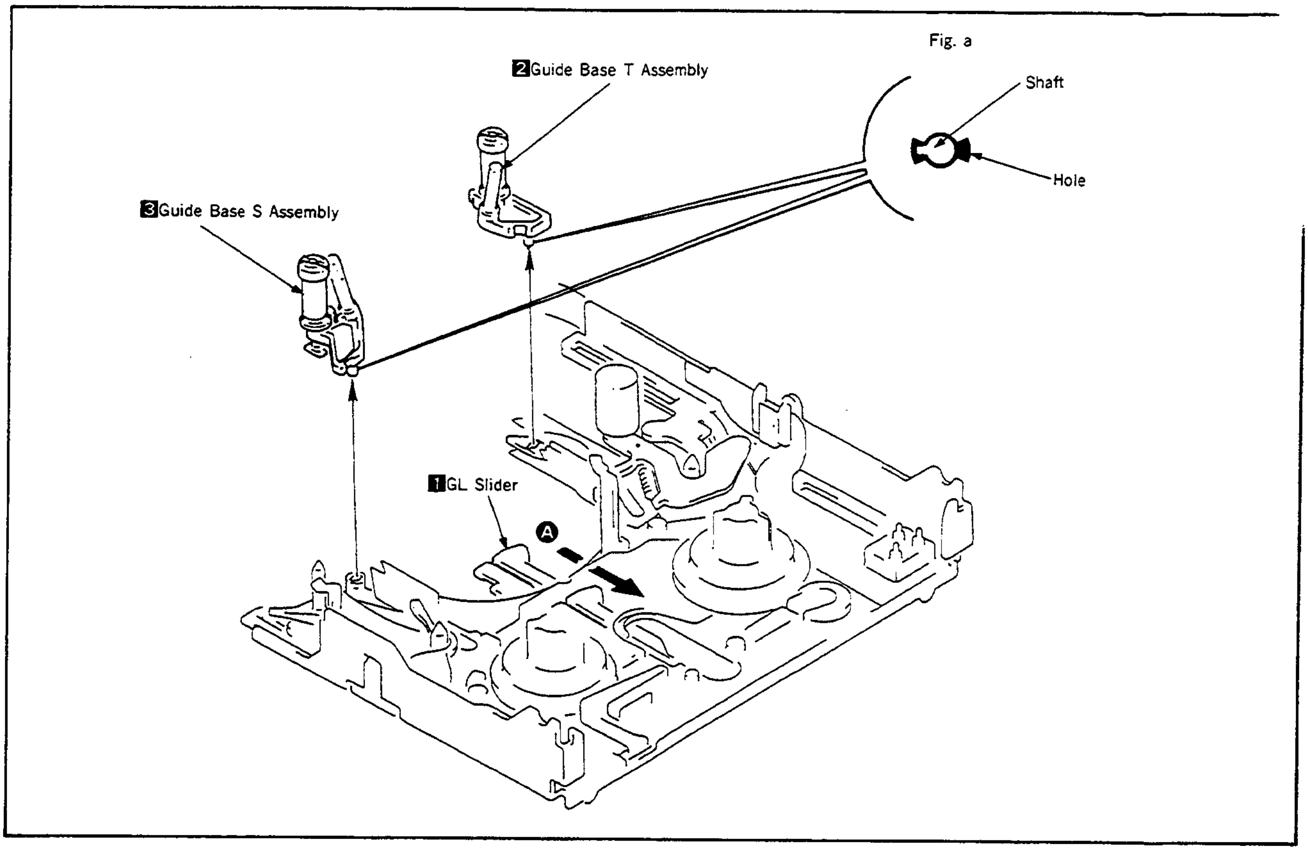


Fig. a
2 Guide Base T Assembly
Shaft
Hole
3 Guide Base S Assembly
1 GL Slider
A

Fig. 15

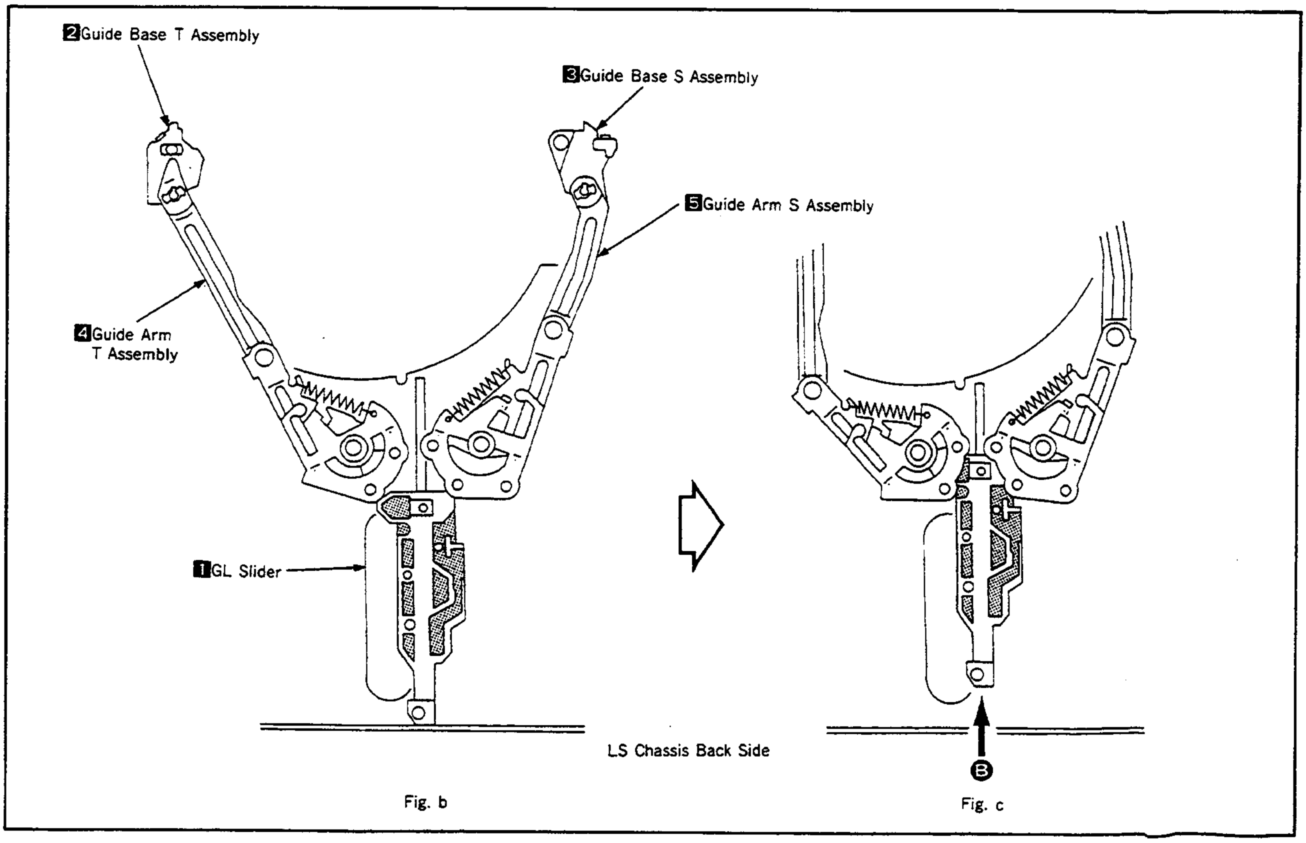

2 Guide Base T Assembly
3 Guide Base S Assembly
5 Guide Arm S Assembly
4 Guide Arm T Assembly
1 GL Slider
LS Chassis Back Side
B

Fig. b

Fig. c

Fig. 16

3 GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers ❶, then the guide arm T assembly ❷ and guide arm S assembly ❸ respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly ❷ and guide arm S assembly ❸, then fix them with a lock washer ❶ respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guide-base S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

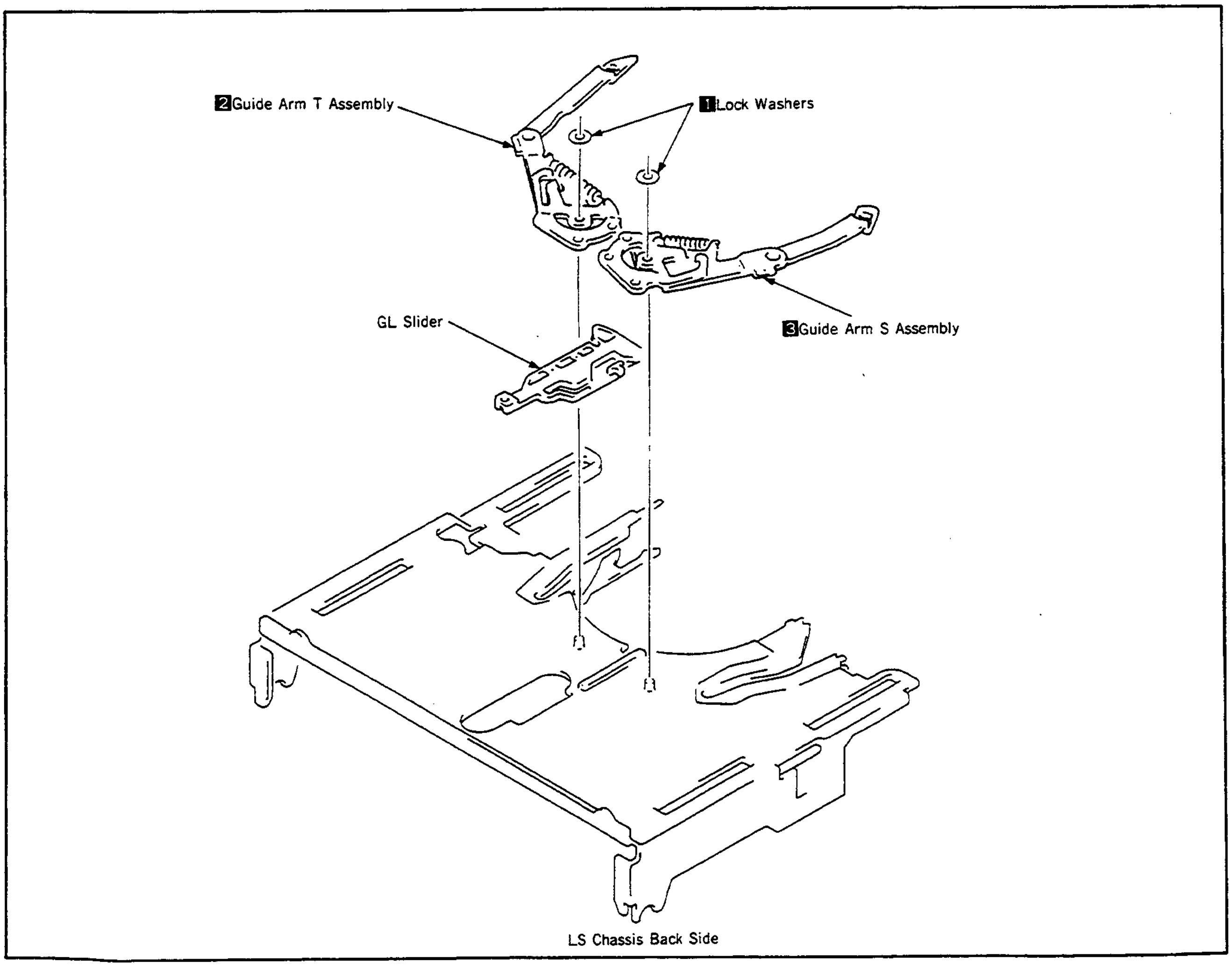


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw ❶, then the string ❷ from the supply reel table assembly ❸. For easy removal of string block ❹, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly ❸.
8) Remove a tension coil spring ❺.
9) Turn the TG-1 arm assembly ❻ up to a portion ⓒ of LS chassis hole in the arrow 🅐 direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake ❼ toward the arrow 🅑, mount thesupply reel table assembly ❸.
2) Route the string ❷ under the TG-1 arm asembly ❻, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow 🅐 (Fig. b).
3) Wind the string ❷ along the groove of supply reel t assembly ❸ (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), shift the string block ❹ toward the arrow 🅒 and tighten the screw ❶ (Fig. a).
5) Engage the tension coil spring ❺ to the chassis hook.

Note : Confirm that the string ❷ is surely wound around the groove of supply reel table assembly ❸ (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm. (Refer to 3-5 Take-up Reel Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembly.

Note : Referring to 3-22, adjust the tension regulator position.

Note : Referring to 3-23, adjust the forward back tension.

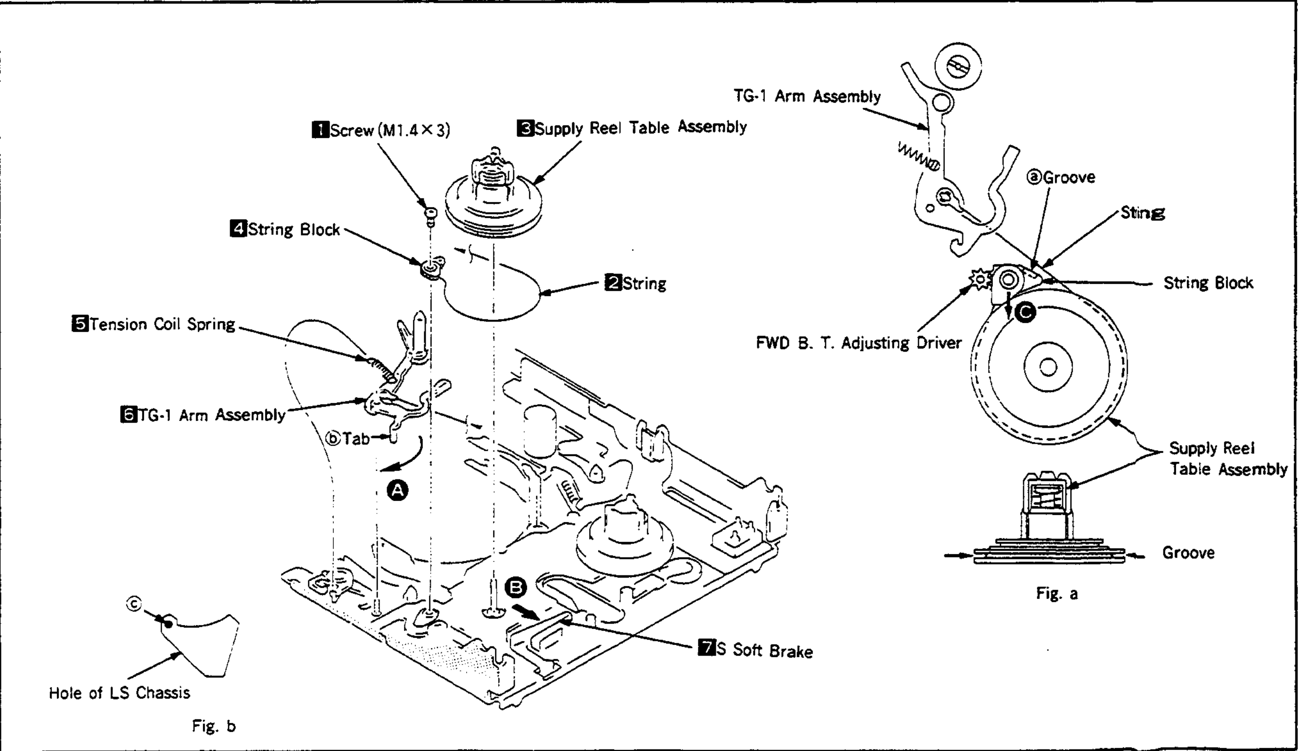

❶Screw (M1.4×3)
❸Supply Reel Table Assembly
❹String Block
❷String
❺Tension Coil Spring
❻TG-1 Arm Assembly
ⓑTab
🅐
🅑
❼S Soft Brake
ⓒ
Hole of LS Chassis
Fig. b
TG-1 Arm Assembly
ⓐGroove
Sting
String Block
🅒
FWD B. T. Adjusting Driver
Supply Reel Table Assembly
Groove
Fig. a

Fig. 18

3 . TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly ❶ .
2) Remove a compression coil spring ❷ .

2. Mounting

1) Insert a compression coil spring ❷ into the boss on chassis.
2) Rotate gently the TG-2 roller assembly ❶ until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.

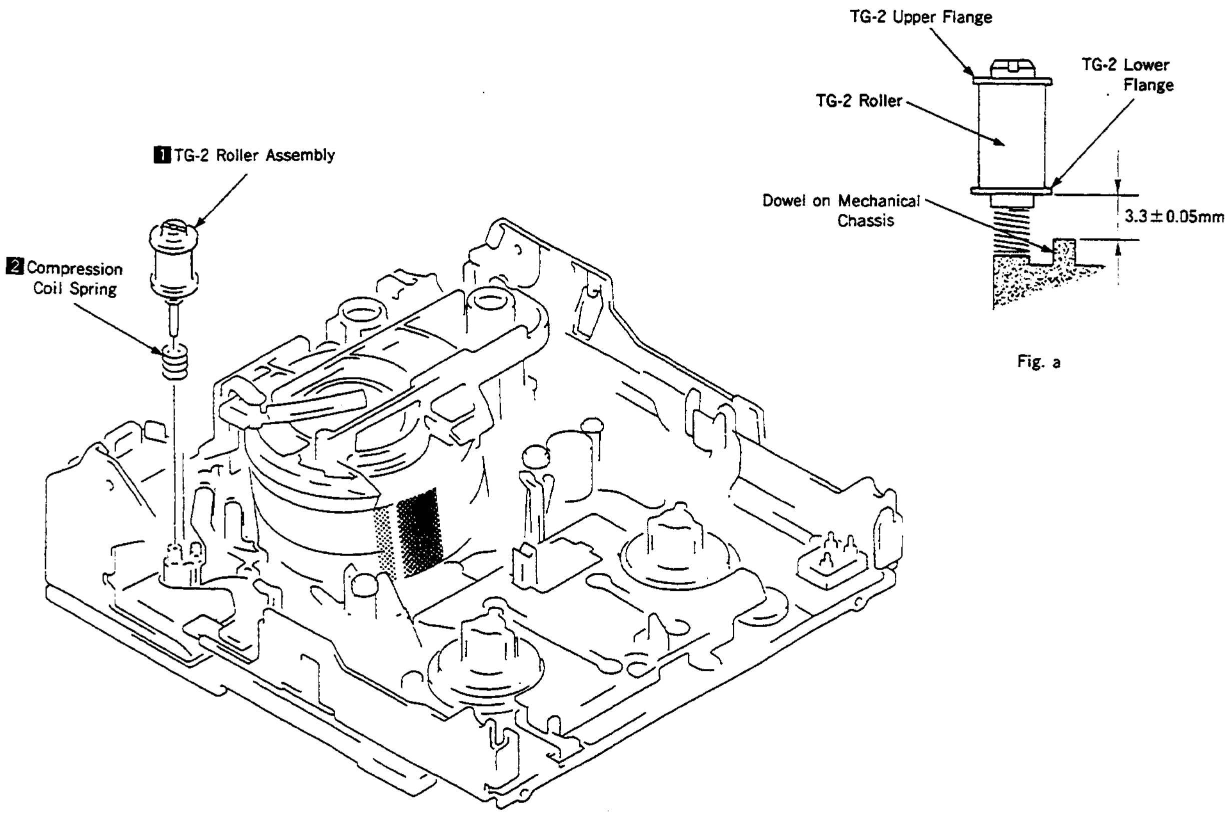

❶ TG-2 Roller Assembly
❷ Compression Coil Spring
TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm
Fig. a

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring **1** in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly **2** from the shaft of mechanical-chassis.

2. Mounting

1) Mount the TG-7 arm assembly **2** to the shaft of mechanic chassis.
2) Mount the TG-7 arm Leaf spring **1** to the mechanicalchasis.
 * Push in the tab of Leaf spring until it clicks into a detent ofchassis (Fig. a).
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

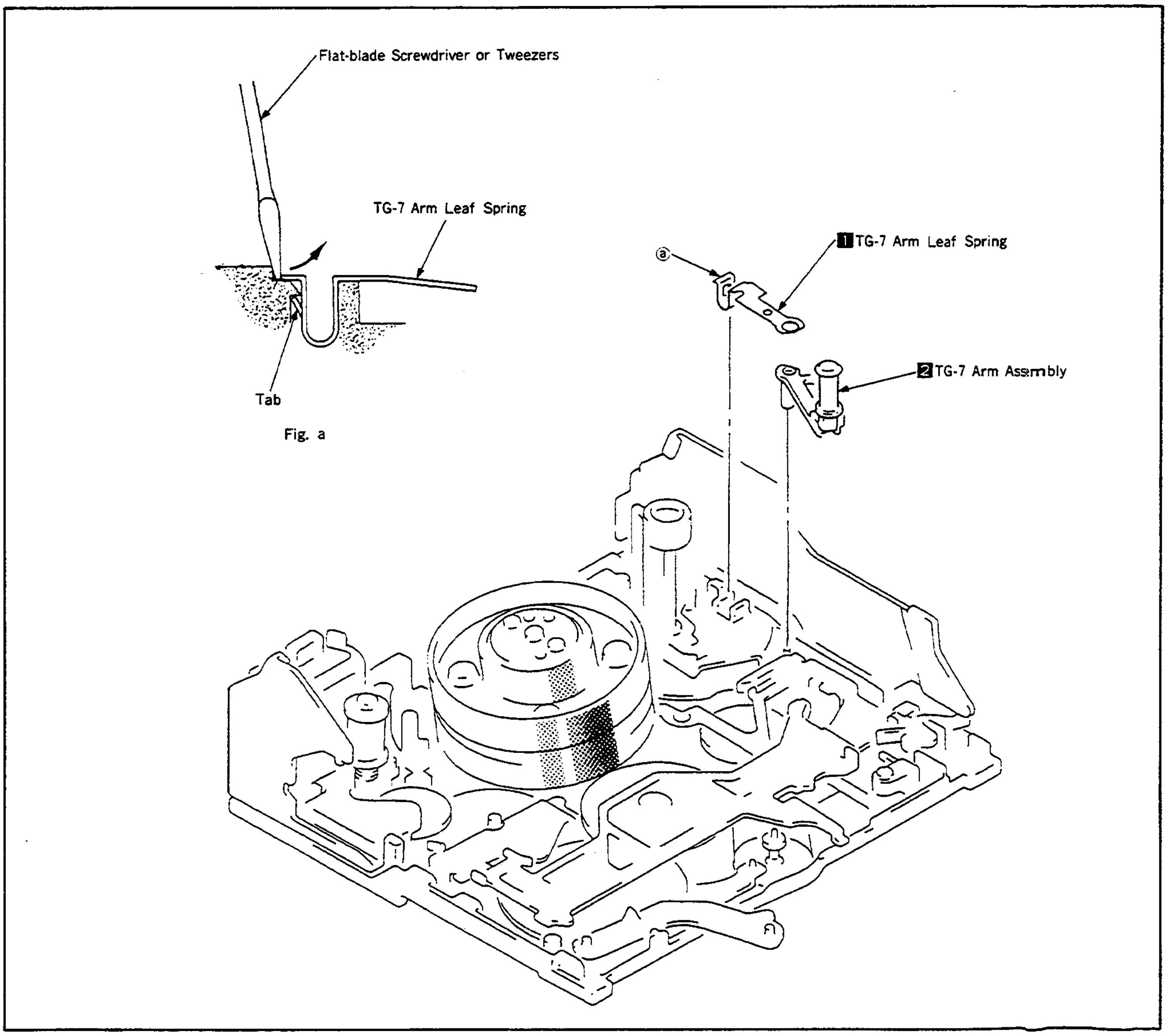


Fig. 20

3 . LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the LOAD mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

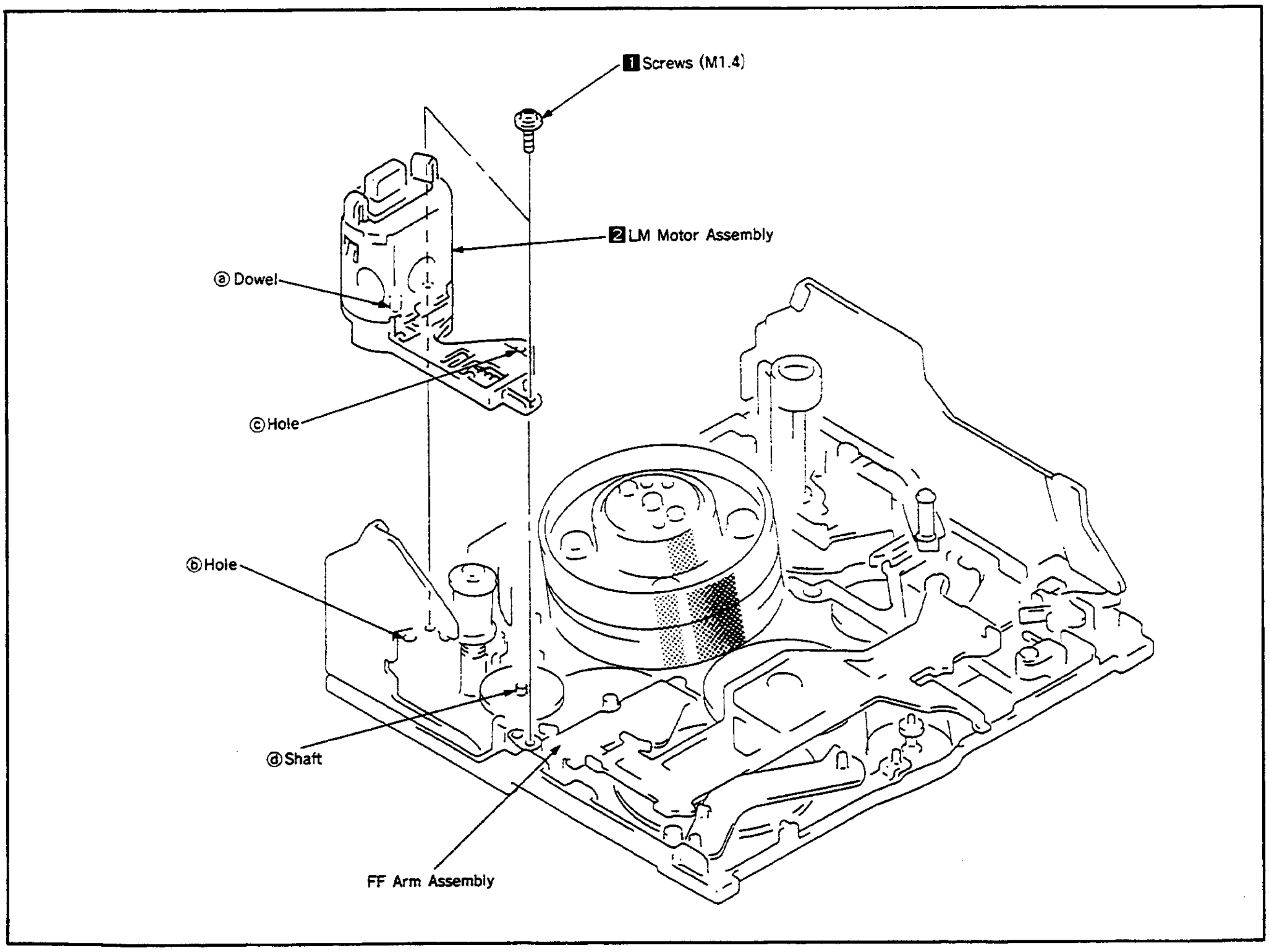


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm ❶ from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller ❷.

2. Mounting

1) Mount the LS arm ❶ meeting with mechanical chassis sh and cam groove.

Note : Move the LS arm ❶ in arrow direction to confirm that the LS roller ❷ is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

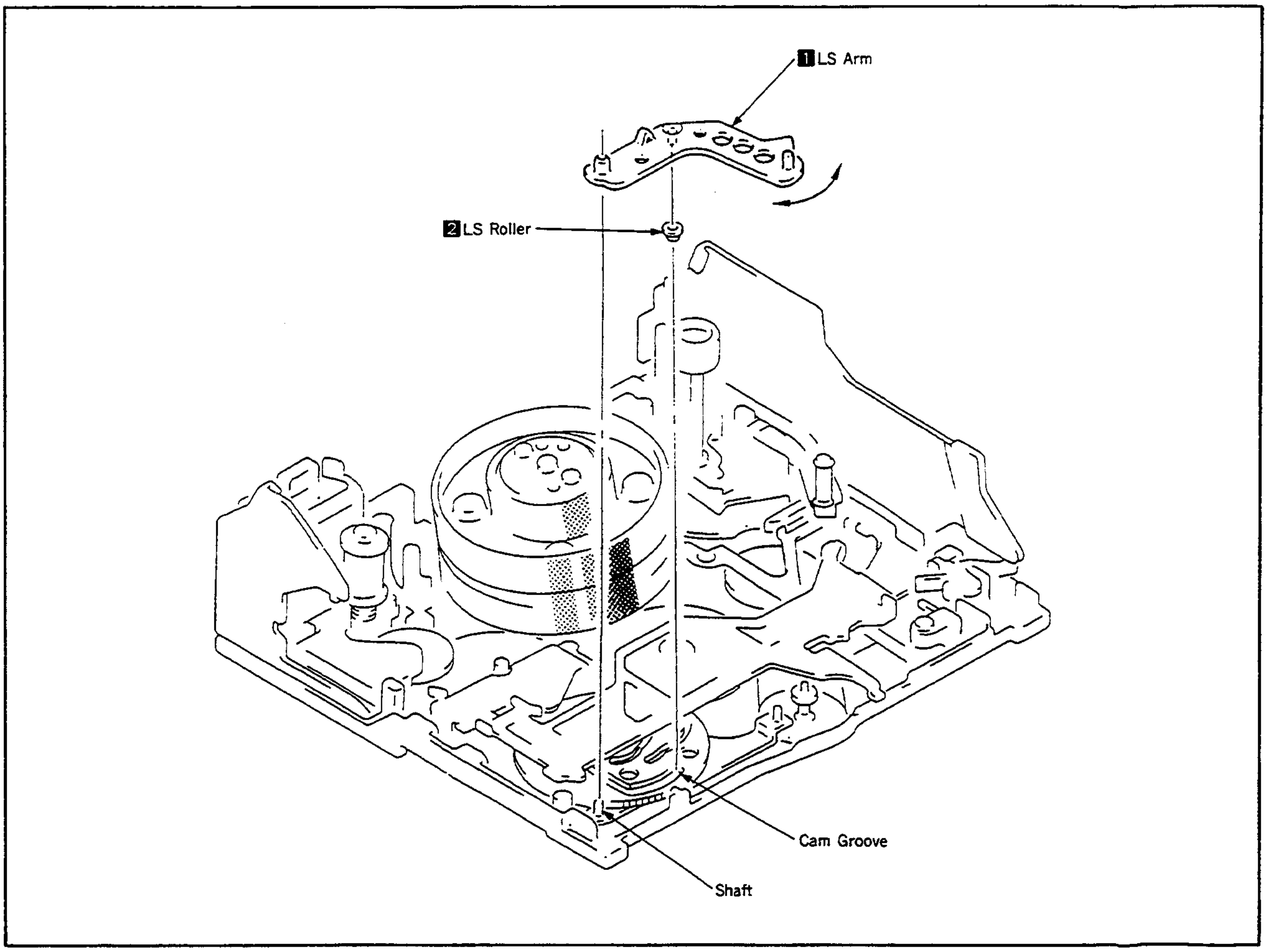


Fig. 22

. M SLIDER ASSEMBLY (Fig. 23)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

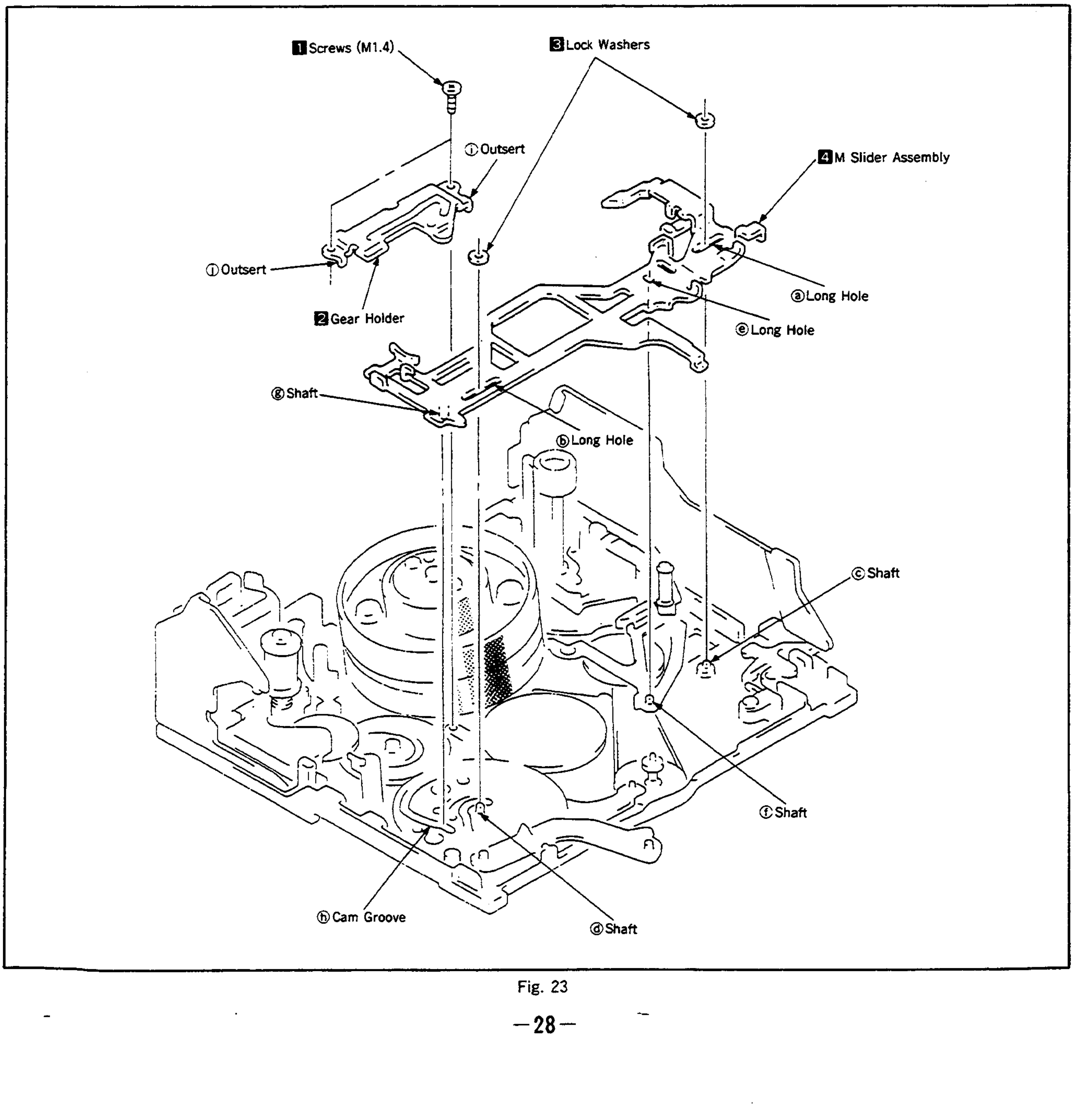

❶Screws (M1.4)
❸Lock Washers
ⓘOutsert
❹M Slider Assembly
ⓙOutsert
ⓐLong Hole
❷Gear Holder
ⓔLong Hole
ⓖShaft
ⓑLong Hole
ⓒShaft
ⓕShaft
ⓗCam Groove
ⓓShaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer ❶, then pinch press arm assembly ❷.

2.Mounting

1) Mount the pinch press arm assembly ❷, inserting its sh ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ in the shaft ⓓ of mechanical chassis.
2) Mount the lock washer ❶.
3) After mounting, shift the pinch press arm assembly toward the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

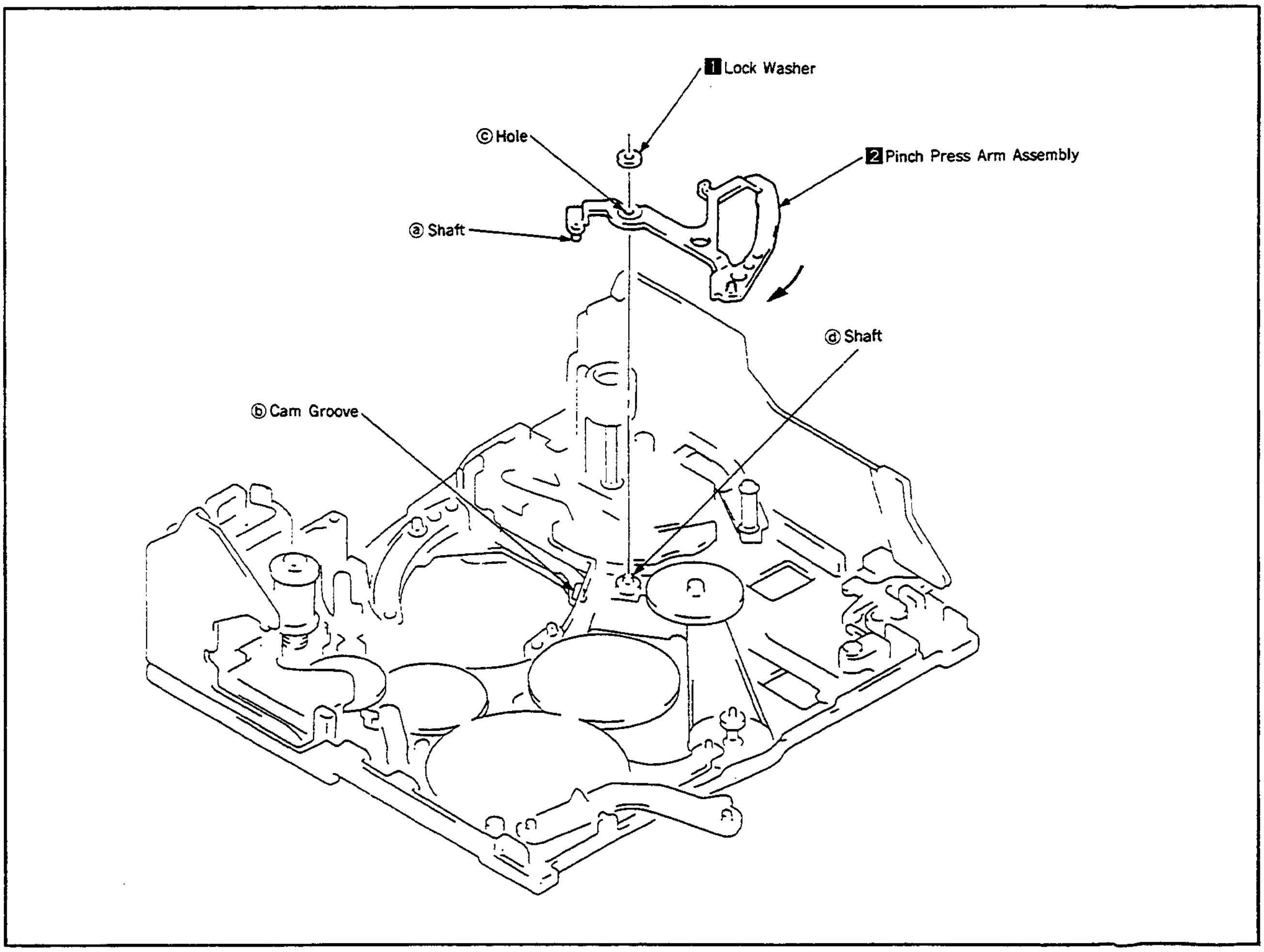


Fig. 24

. CAM (Fig. 25)

emoval

Referring to 1-1, remove the cassette compartment assembly.
Referring to 3-1, remove the Retainer, Gooseneck assembly.
Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam ❶.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam ❶, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

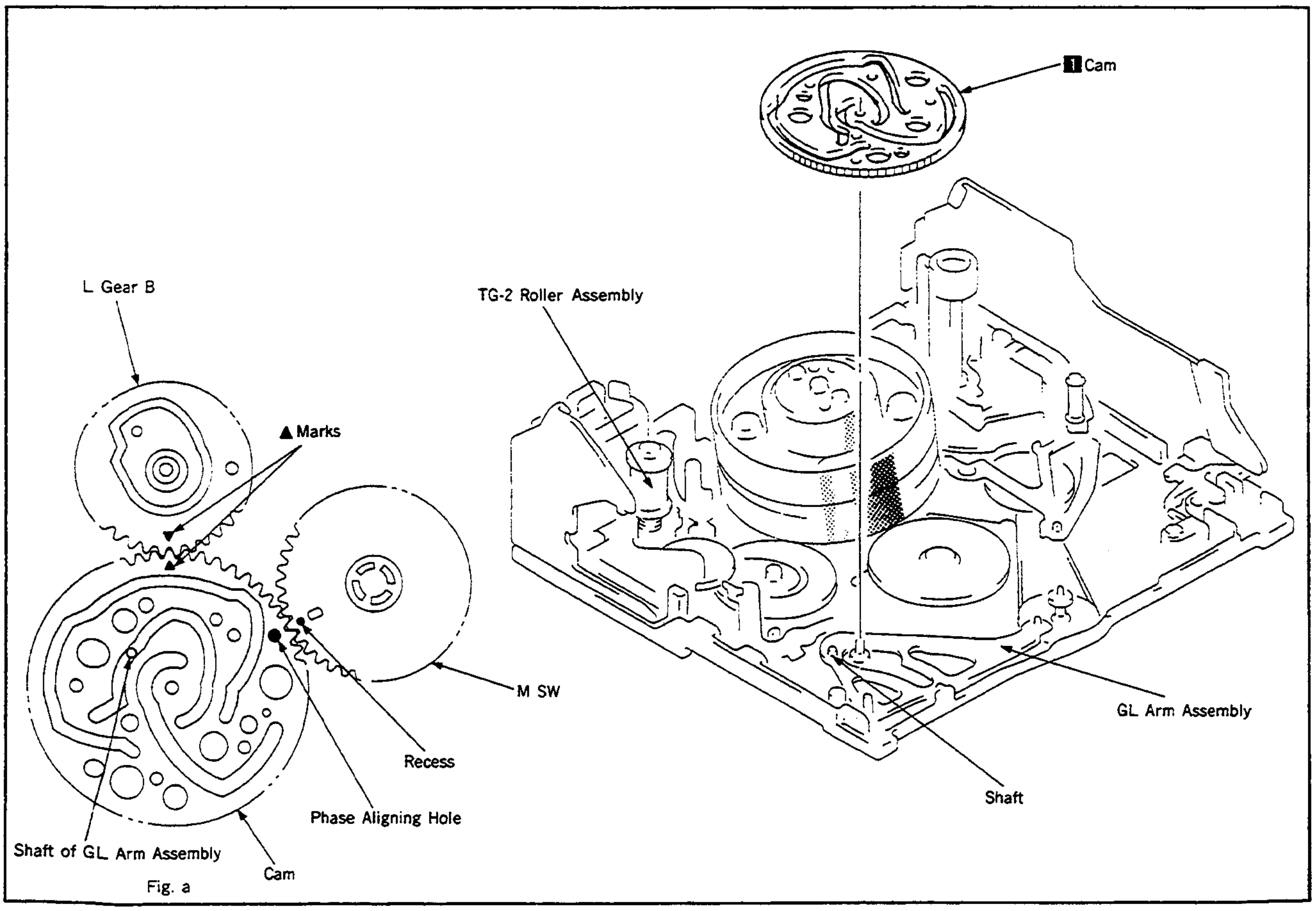


Fig. a

Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly ❶.

2. Mounting

1) Mount the GL arm assembly ❶ with its hole ⓐ inserted in the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

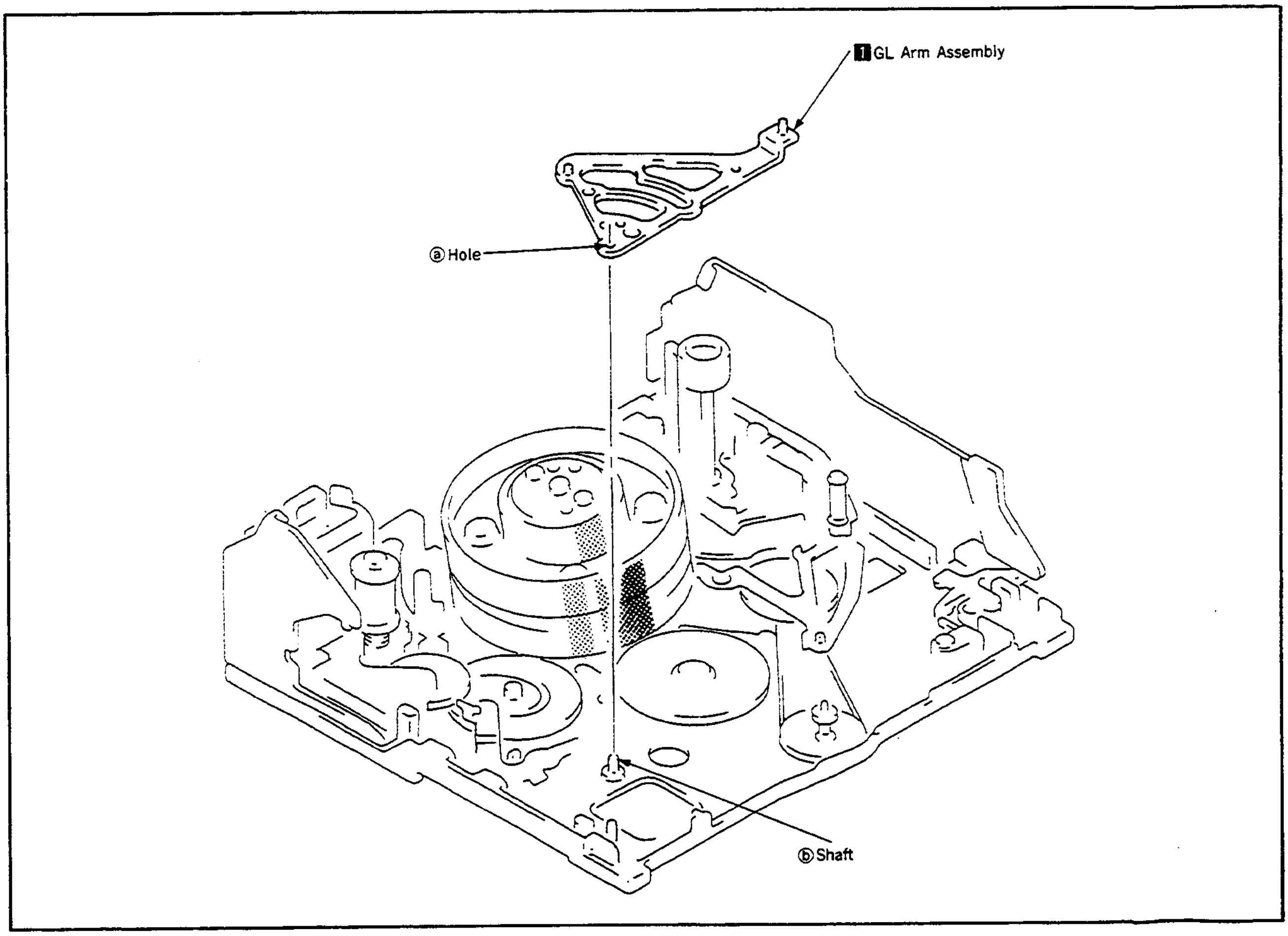


Fig. 26

9. L GEAR A AND L GEAR B (Fig. 27)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly ❶.
10) Remove the L gear A ❷.
11) Remove the L gear B ❸.

2. Mounting

1) Insert the L gear B ❸ into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A ❷ into the shaft of mechanical chassis.
3) Mount the FF arm assembly ❶ with its two shafts inserted into the cam groove of L gear B ❸ and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

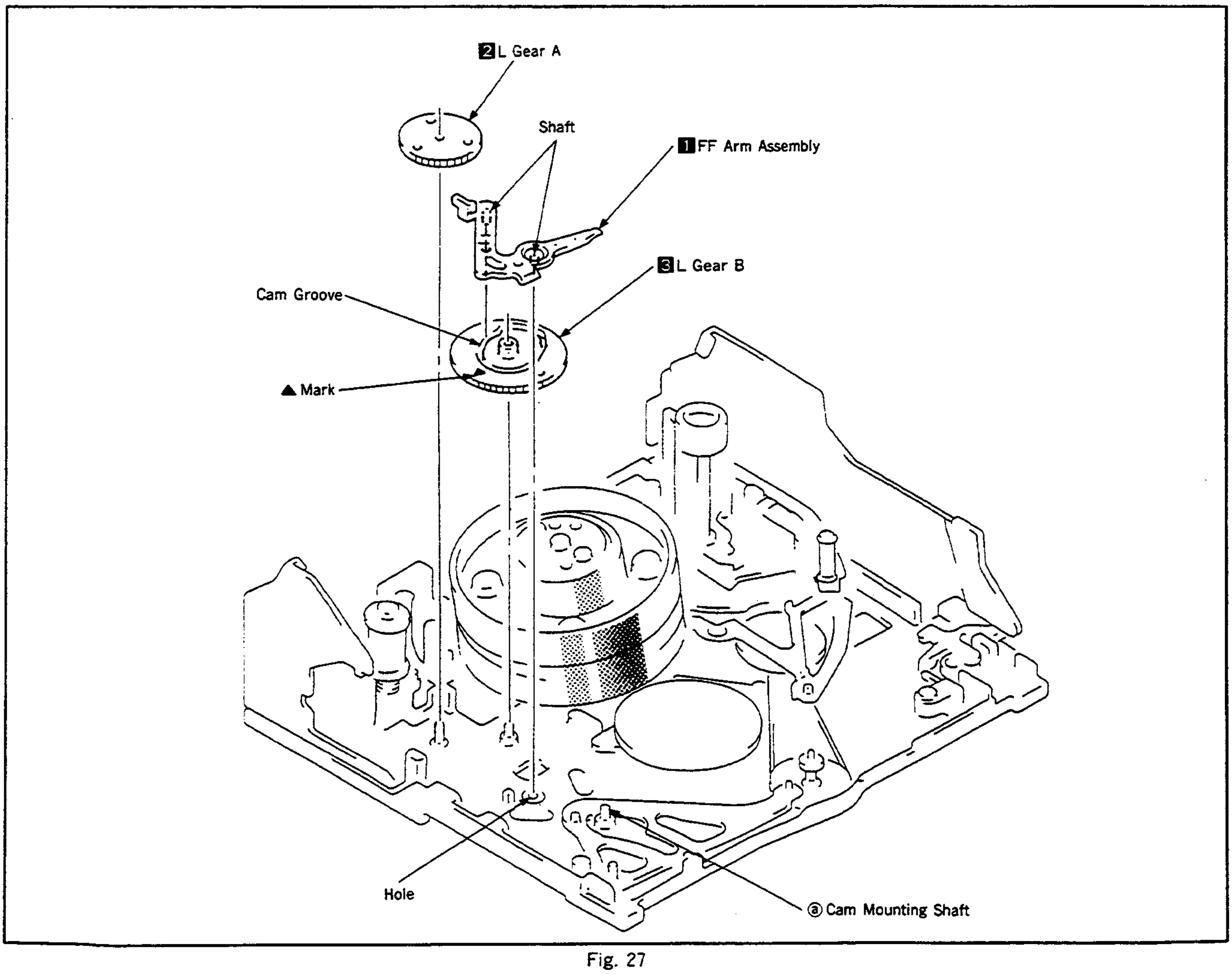


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11)Remove a lock washer **1**, then remove together the Change gear assembly **2**, relay belt **3** and relay pulley **4**.

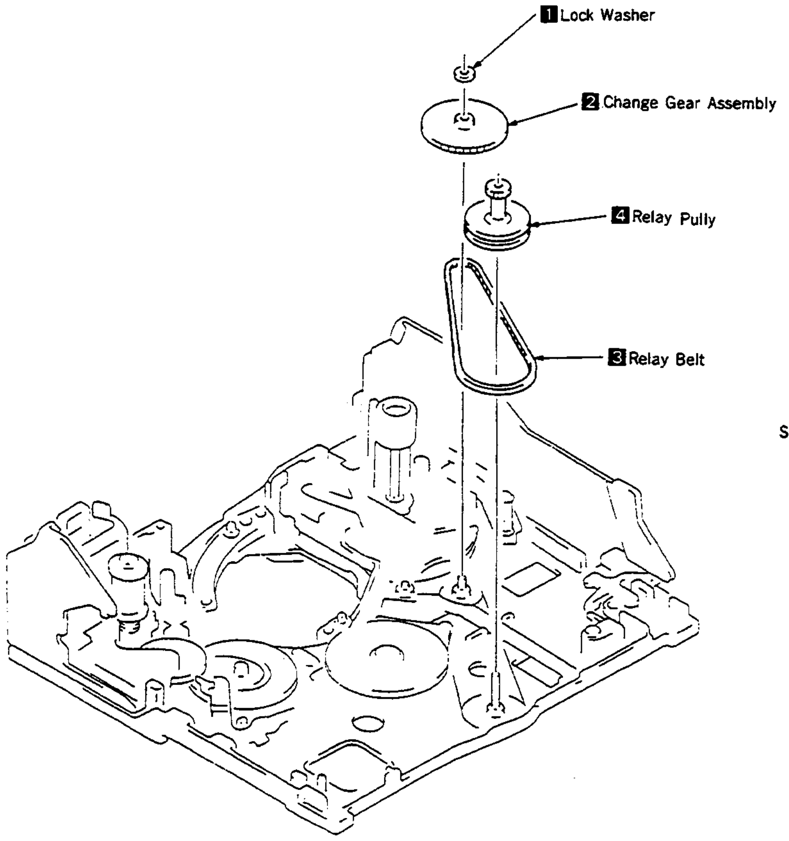
2. Mounting

*Give one or two drips of oil to the conversion gear shaft and relay pulley shaft respectively. (Oiling range is under the neck as shown in Fig. a.)

1) Hooking the relay belt **3** to the relay pulley **4** and Change gear assembly **2**, mount respective parts.
   *At first, insert the relay pulley into the mechanical chassis-shaft, then the change gear assembly by engaging with the capstan motor gear.

Note : Take care not to damage the Change gear by the capstan motor gear.

2) Mount a lock washer **1**.
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly.
12) Referring to 1-1, mount the cassette compartment assembly.



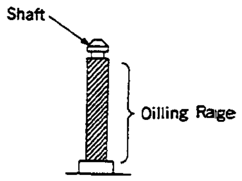


Fig. a

Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

· If possible, make a recording before removal.

1) Remove the two screws **1** (Fig. 29).
2) Mount the jig **2** (Ref. No. J-10) with the two supplied screws **3**, then screw the attached hexagon socket screws **4** to the jig **2**. The rotary upper drum **5** will move upward and come off (Fig. 30).

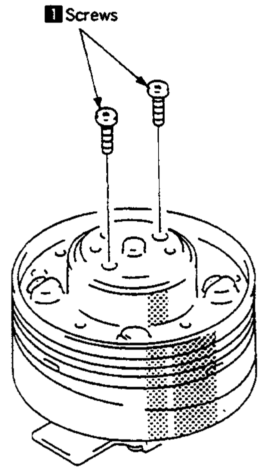


Fig. 29

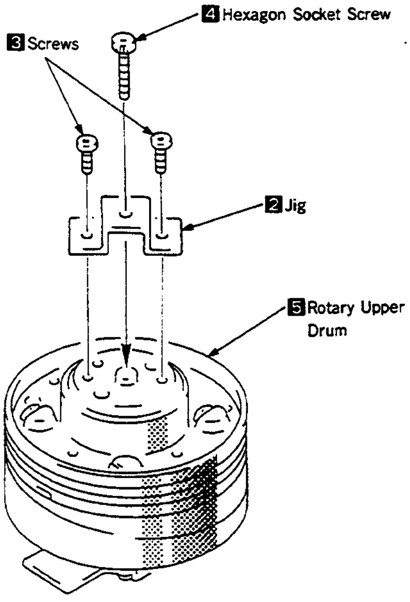


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum **5** surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig **6** (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum **5** by passing the jig through its positioning hole **7**. (Fig.31)
3) Remove the jig **6** and push down the rotary upper drum **5** gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws **1** alternately (Fig.29).
4) Insert the jig **6** into the positioning hole **7** again and confirm that it goes in smoothly. If it does not, loosen the two screws **1**, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws **1**.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

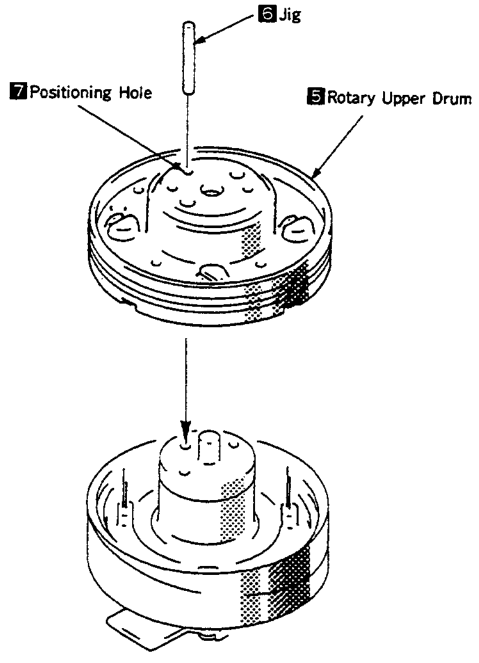


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw **1**.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw **1**.

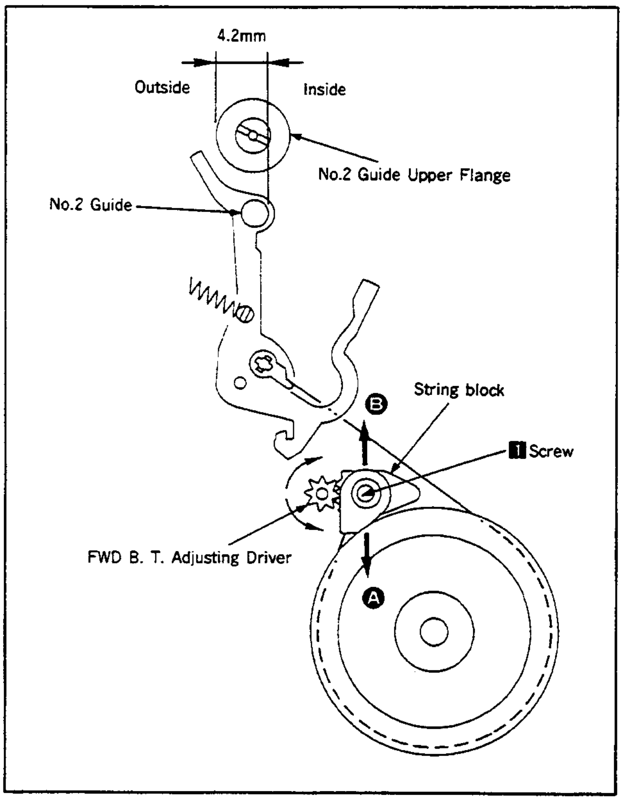

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
String block
Ⓑ
1 Screw
FWD B. T. Adjusting Driver
Ⓐ

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
   If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

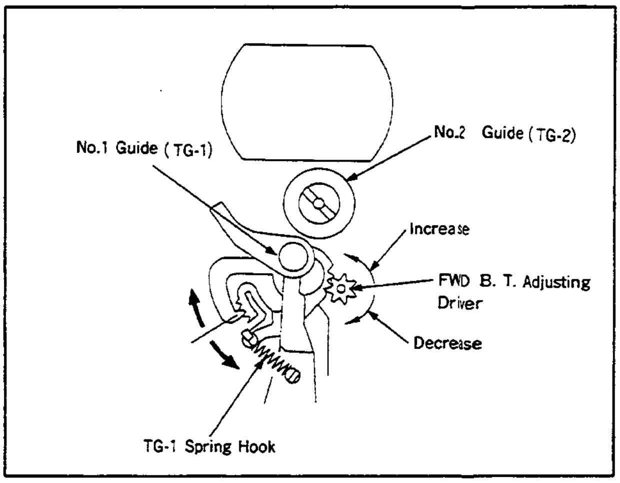

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuation center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T reel table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series
Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode
If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

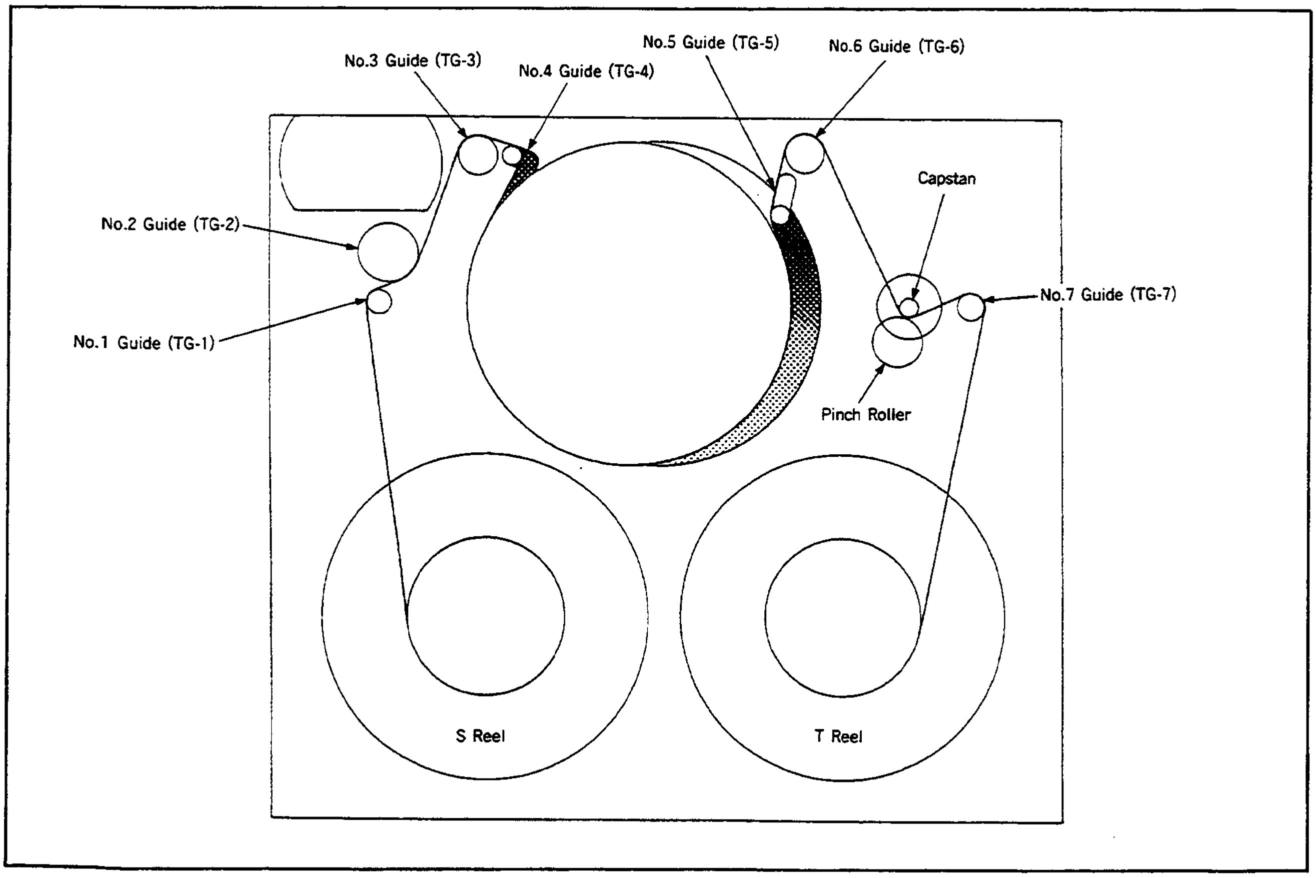


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).

Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

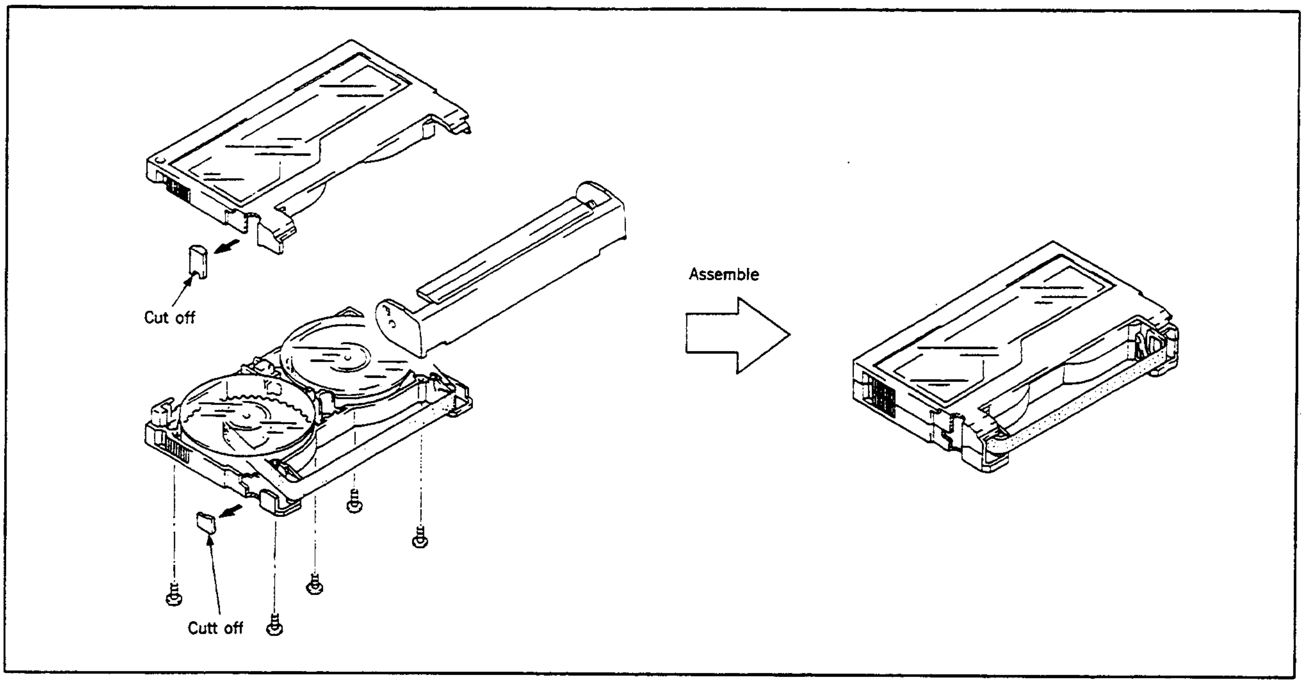


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
      CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
      CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

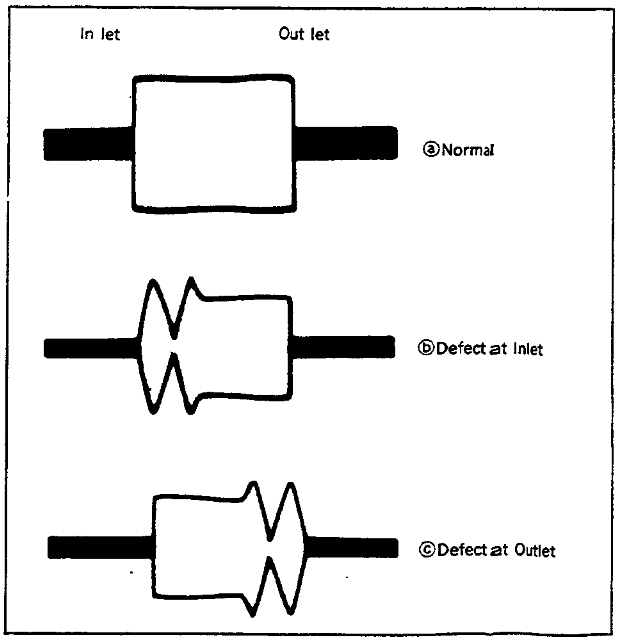


Fig. 35

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw ❶ and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw ❶ to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw ❷ and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw ❷ to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.
: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

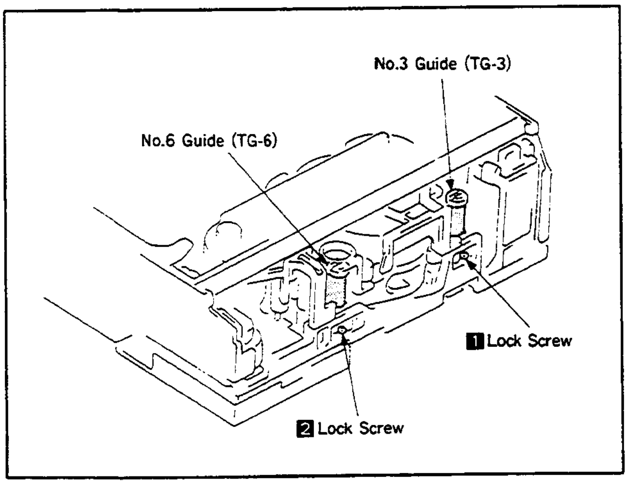


Fig. 36

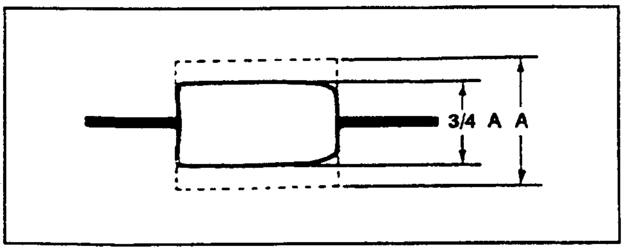


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 38)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

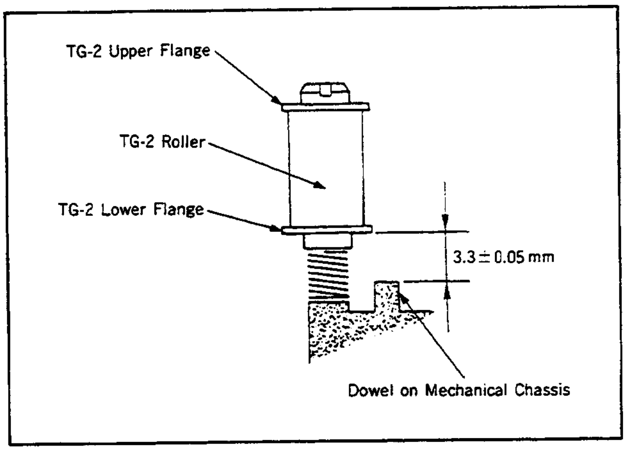


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No.2 guide (TG-2) ❶ (Fig. 39). If it is, turn the upper flange ❸ of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

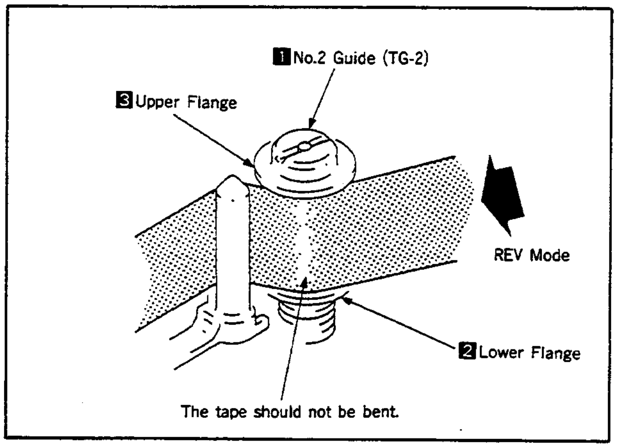


Fig. 39

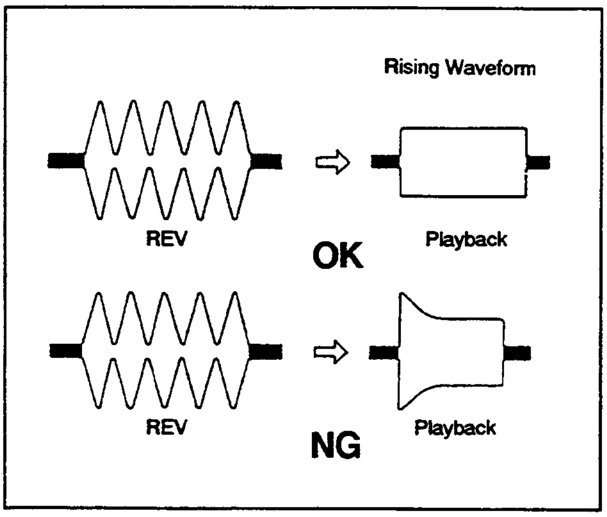


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) ❶ and the capstan ❷. If it is, turn the hight adjusting screw ❹ of the No.7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) ❸ until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3mm or less, adjustment can be considered completed.

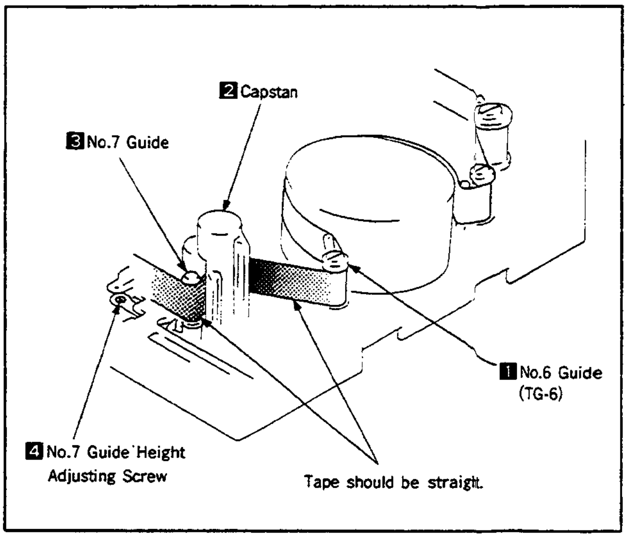


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig.42).
   Otherwise, perform section 4-2 Tracking Fine Adjustment.

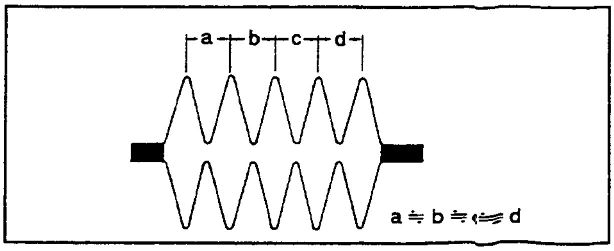


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (EMIN) is 65 % of the maximum value (EMAX) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

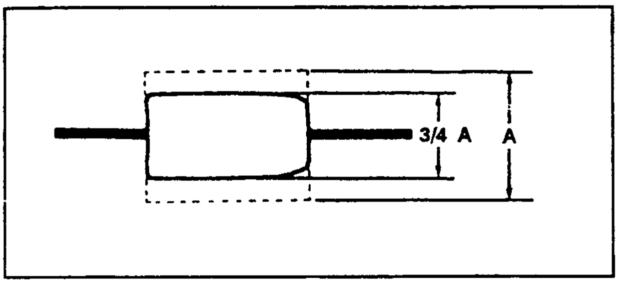


Fig. 43

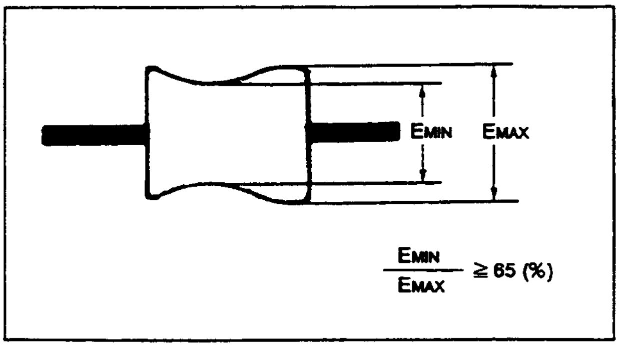

EMIN
EMAX
EMIN / EMAX ≧ 65 (%)

Fig. 44

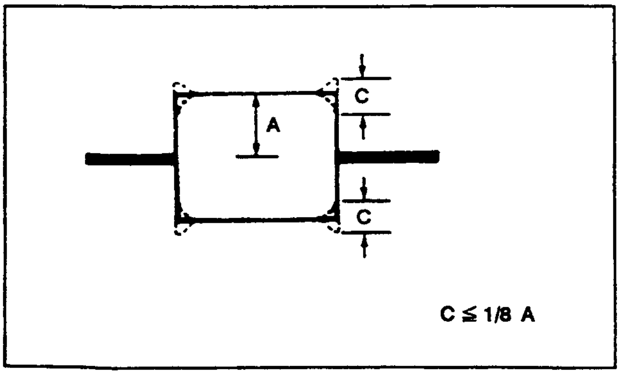


Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

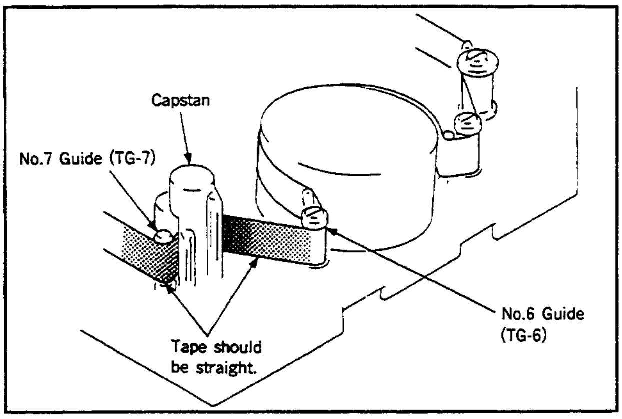

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

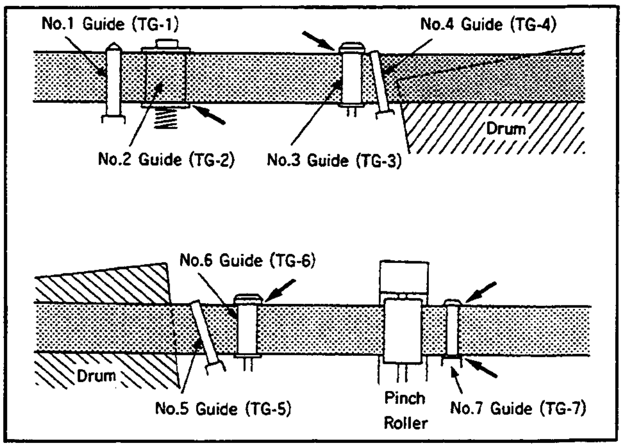

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47

8mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM

SUPPLIMENT-2

Video 8

〈Connection of Mode Selector IV Conversion Connector〉

In use of Mode selector IV conversion connector(J-6082-167-A), there are two different connecting methods depending on the model connected:

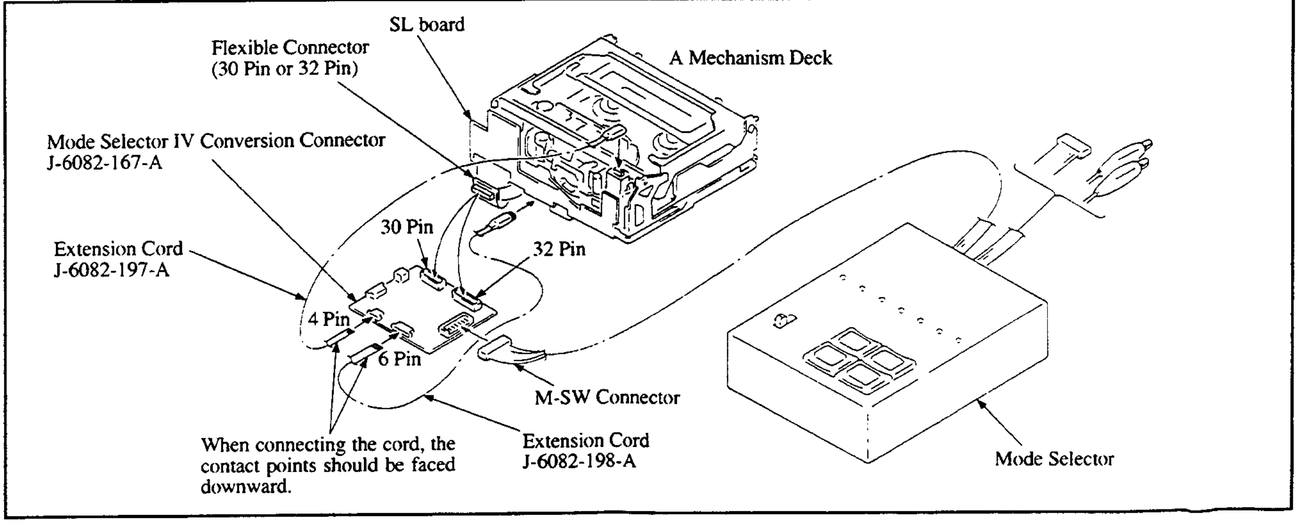
1. CCD-FX series

With the SL board mounted on mechanical deck, connect 30-pin(or 32-pin) connector to 30-pin(or 32-pin) Mode selector IV conversion connector.

(CCD-FX300 series, FX400 series. FX500 series
→ 30-pin connector (FP425 or FP600)
CCD-FX700 series → 32-pin connector (FP477))

2. Models other than above

Connect the extension cord(J-6082-197-A) to loading motor 4-pin connector and extension cord (J-6082-198-A) to mode switch 6-pin connector in mechanical deck, then connect the other end of cord to 4-pin and 6-pin connectors of Mode selector IV conversion connector respectively, as shown below.


SL board
Flexible Connector
(30 Pin or 32 Pin)
A Mechanism Deck
Mode Selector IV Conversion Connector
J-6082-167-A
30 Pin
32 Pin
Extension Cord
J-6082-197-A
4 Pin
6 Pin
M-SW Connector
When connecting the cord, the contact points should be faced downward.
Extension Cord
J-6082-198-A
Mode Selector

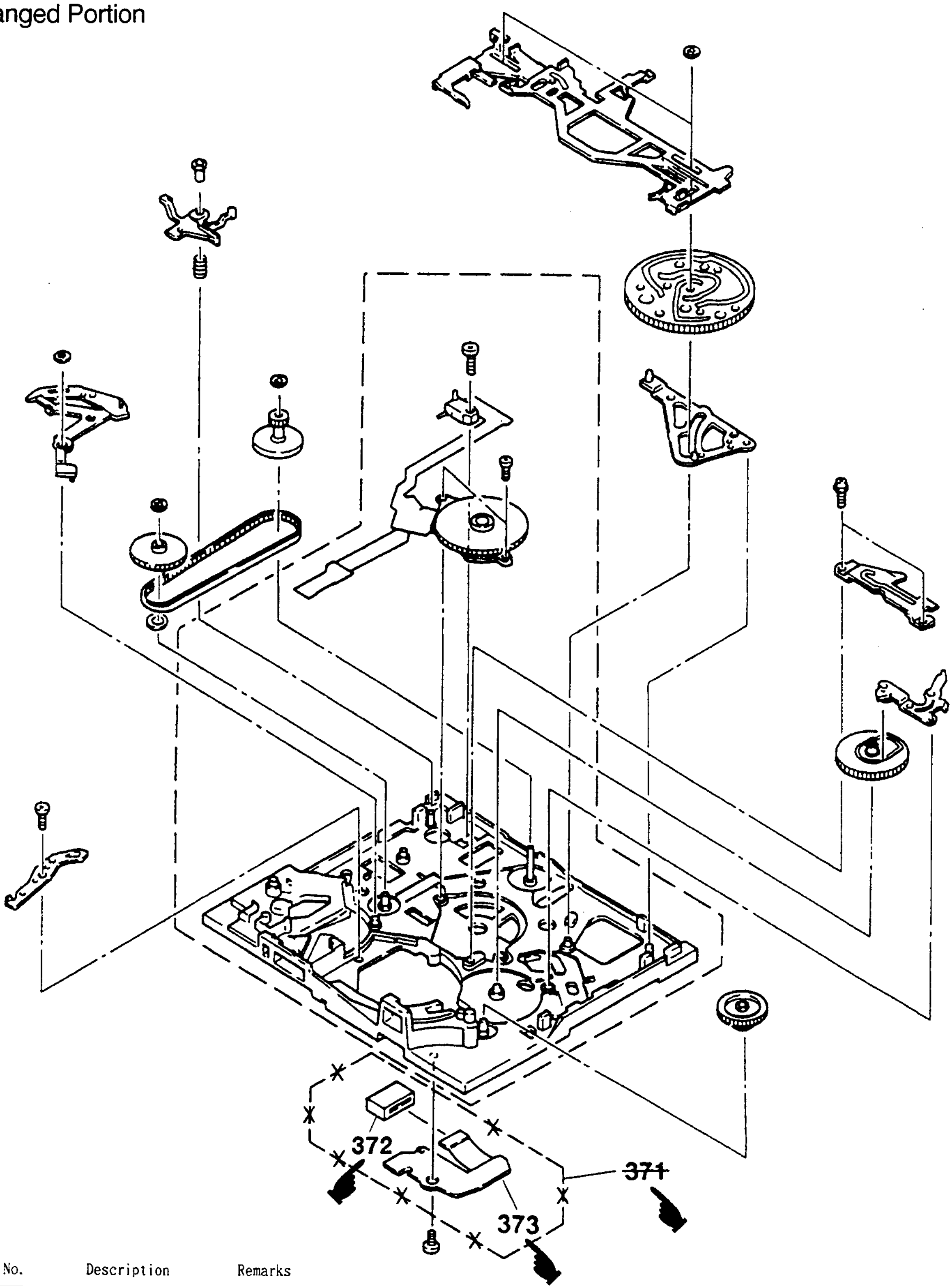
〈CORRECTION〉

P10. 2-4 Service jigs list

		Incorrect		Correct
J-15	FWD B.T adjusting driver	J-6082-182-A	➡	J-6082-187-A

MECHANISM CHASSIS ASSEMBLY (2)

☛ : Changed Portion



Ref.No.	Part No.	Description	Remarks
~~371~~	~~A-7040-311-A~~	~~FP-444 ASSY~~	☛
372	1-691-254-13	CONNECTOR, TRANSLATION 10P	☛
373	1-641-639-13	FP-442 FLEXIBLE BOARD	☛

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